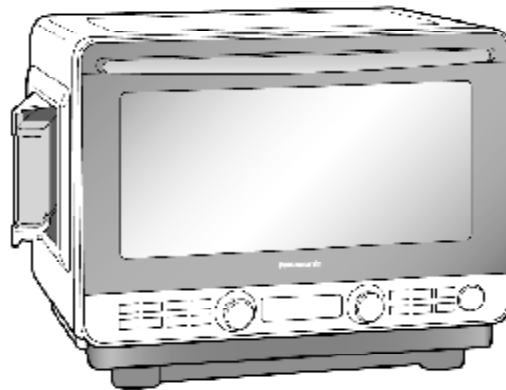


Order No. MOD0311270C3

Service Manual

Microwave Oven

NN-J993



SPECIFICATIONS

Power Source:		240 V AC Single Phase, 50 Hz For MPQ, YPQ models 220 V AC Single Phase, 50 Hz For HPE, TPE, XPE models 220 V AC Single Phase, 60 Hz For LPK model 110 V AC Single Phase, 60 Hz For WTT model
Power Requirement:	Microwave	1,220 W 220/240 V model 1,350 W 110 V model and LPK models
	Heater	1,360/1,380 W
Output:	Microwave	1,000 W: Full Power (IEC 705-88)
	Heater	1,360/1,380 W
Microwave Frequency:		2,450 MHz
Timer:		30 min. / 2 hr. / 5 hr.
Outside Dimensions:		384 mm (H) X 500 mm (W) X 450 mm (D)
Oven Cavity Dimensions:		234 mm (H) X 394 mm (W) X 309 mm (D)
Weight:		Approx. 22.5 kg
PbF:		This product with PbF
Specifications subject to change without notice.		

Panasonic®

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

* This product should be serviced only by trained, qualified personnel.

This service manual covers products for following markets.

When troubleshooting or replacing parts, please refer to the country identifications shown below for your applicable product specification.

YPQ For Singapore

MPQ For Malaysia

HPE For Hong Kong

WTT For Taiwan

TPE For Thailand, Indonesia

LPK For Philippines

XPE For China

INVERTER WARNING

This inverter board looks like a regular PCB; However, this PCB drives the magnetron tube with extremely high voltage and high current.

NEW H.V.



**DANGER
HIGH
VOLTAGE**

IT HAS: 1. Very high voltage and high current circuit.

It functions the same as the high voltage transformer and high voltage capacitor in ordinary microwave ovens.

2. Aluminium heat sink is very hot in high voltages and heat energy.

3. Very high voltage may remain in circuitry even when oven is off. High voltages may remain in the capacitors on the board.

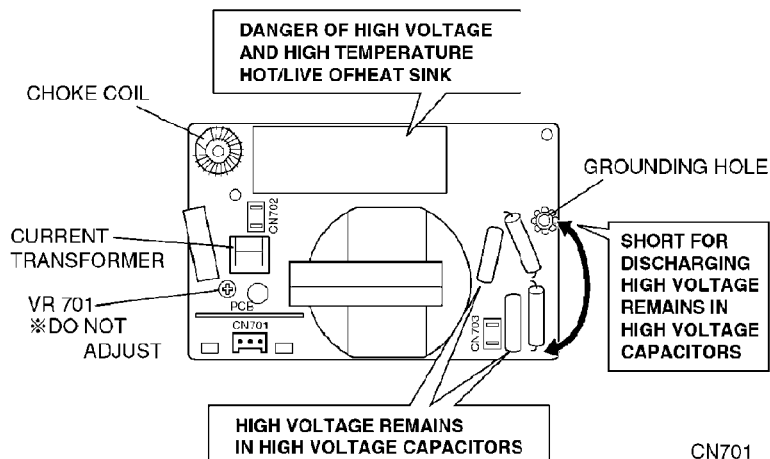
DO NOT: * 1. Do not touch circuitry because it has very hot (high voltage) circuitry. Even when replacing board, extreme care should be taken to avoid possible electric shock hazards. High voltage may remain in circuit.

* 2. Do not touch aluminium heat sink because it is very hot in high voltage and also very hot in high heat energy.

* 3. Do not try to adjust or tamper preset volume on the Inverter board because it is very dangerous to adjust without proper test equipment.

* 4. Do not test oven while Inverter grounding strip or screws are loose. It is very dangerous to operate the H.V. Inverter Circuit (U) with loose mounting screws or if improperly grounded.

INVERTER POWER SUPPLY DIAGRAM



CAUTION

About lead free solder (PbF)

Distinction of PbF PCB: PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

Caution: ● Pb free solder has a higher melting point than standard solder; Typically the melting point is 30 - 40°C higher.

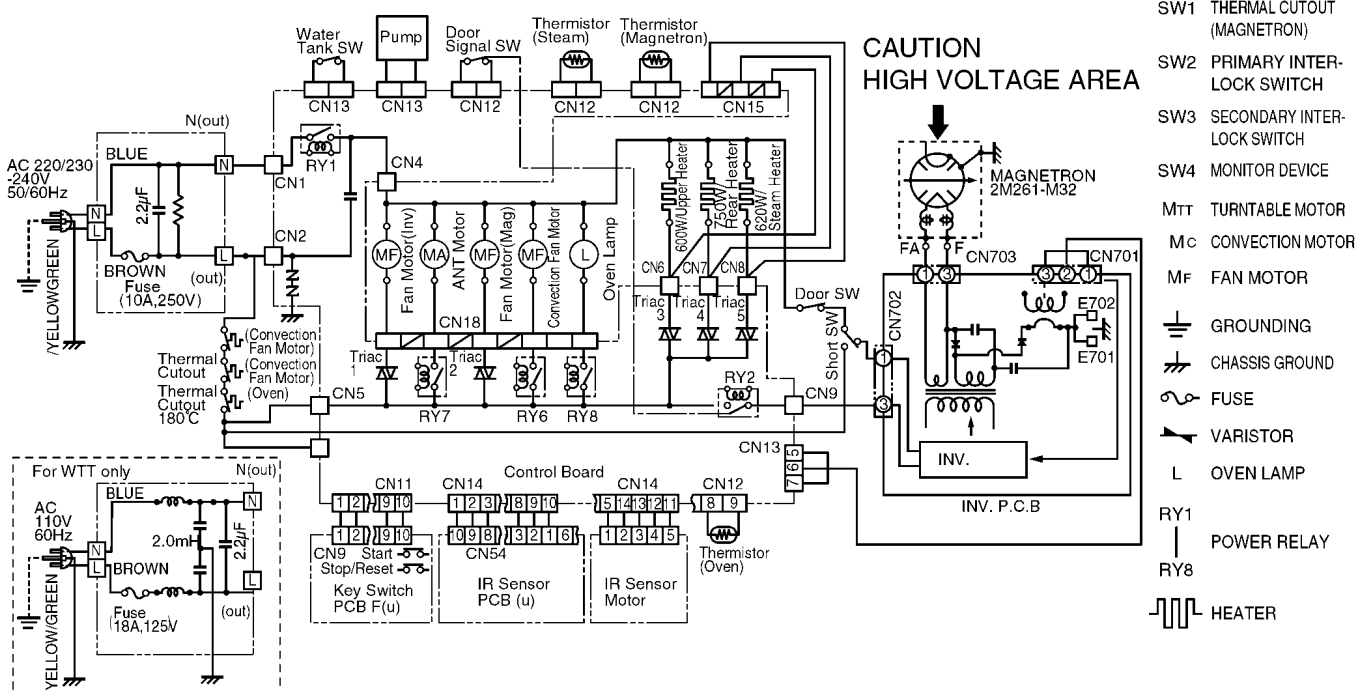
Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 370 ± 10°C.

● Pb free solder will tend to splash when heated too high (about 600°C)

- 1. FEATURE CHART**
- 2. CONTROL PANEL**
- 3. OPERATION AND DIGITAL PROGRAMMER
CIRCUIT TEST**
- 4. SCHEMATIC DIAGRAM**
- 5. DESCRIPTION OF OPERATING SEQUENCE**
- 6. STEAM FUNCTION (STEAM & MICRO POWER AND
Reheat with STEAM.)**
- 7. CAUTIONS TO BE OBSERVED WHEN CAUTIONS
TO BE OBSERVED WHEN TROUBLESHOOTING**
- 8. DISASSEMBLY AND PARTS REPLACEMENT
PROCEDURE**
- 9. COMPONENT TEST PROCEDURE**
- 10. MEASUREMENTS AND ADJUSTMENTS**
- 11. TROUBLESHOOTING GUIDE (NEW H.V.)**
- 12. HOW TO CHECK THE SEMICONDUCTORS USING
AN OHM METER**
- 13. EXPLODED VIEW AND PARTS LIST**

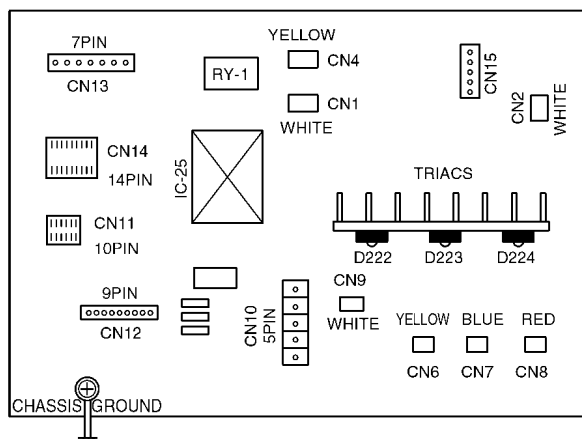
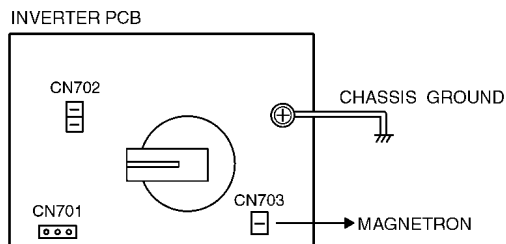
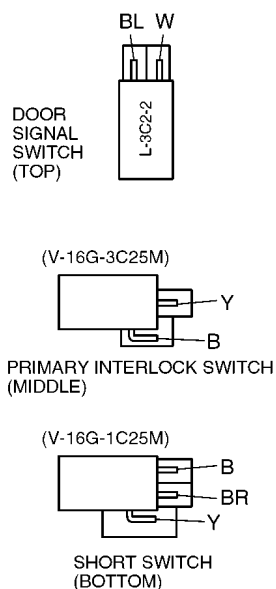
4 SCHEMATIC DIAGRAM

NOTE: Door is closed.
Unit is not operated.



WIRING DIAGRAM

NOTE: *When replacing, check the lead wire colour as shown.
*Colours shown by () indicate colours of lead wire connector housing.



SYMBOL	COLOUR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK

S-6E 1
P107

5 DESCRIPTION OF OPERATING SEQUENCE

5.1. Variable power cooking control

HIGH VOLTAGE INVERTER POWER SUPPLY (U) controls output power by the signal from Digital programmer Circuit (DPC). Power relay 2 stays on while 1000W to 300W selection but the inverter drive signal to control it's output power 150 W and 100 W will be ON-OFF controlled.

NOTE: The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

5.2. Defrost

When auto weight defrost is selected and the start Pad is tapped:

1. The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operating stage in the display window. Table shows the corresponding cooking time for respective serving by categories.

2. When cooking time in the display window has elapsed, the oven turns off automatically by a control signal from the digital programmer circuit.

5.3. Convection Grill Cooking Control

The digital programmer circuit controls the ON-OFF time of the heater in order to control oven cavity temperature.

1. After the start pad is tapped with the desired Bake-Broil program set, an high level signal comes out Micro-Computer circuit and is applied to gate of triacs, D222 and D223.

2. When triacs turns on, power source voltage is applied the heater and the heater turns on.

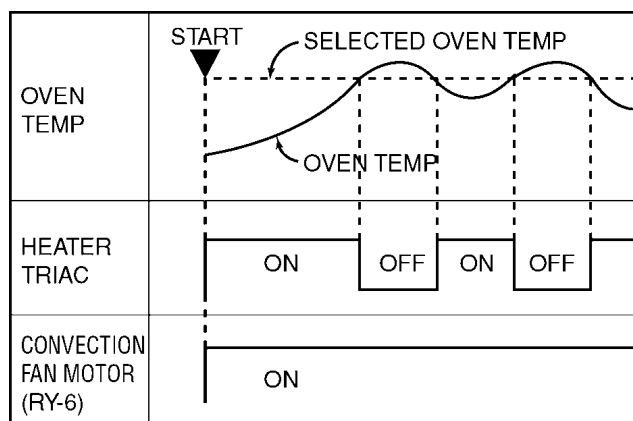
3. When the oven temperature reaches the set temperature, the digital programmer circuit senses the temperature through oven temp sensor and stops supplying high level signal to the triacs and the heater turns off.

4. After the heater turns off, the oven temperature will continue increasing a while and then decrease as shown in Figure. When the oven temperature drops below the set temperature, the digital programmer circuit senses the signal and starts supplying an high level signal to the triac again.

POWER SETTING	ON-OFF TIME OF POWER RELAY 2 (RY2)	
	ON (SEC)	OFF (SEC)
1000W	0	0
700W	0	0
600W	0	0
300W	0	0
150W	12	4
100W	7	14

Defrost

WEIGHT SELECTED	TOTAL DEFROSTING TIME
1.0 kg	17 min.
2.0 kg	35 min.



96-017M

5.4. Combination cooking control

Combination cooking is accomplished by microwave and convection cooking being done alternately during one combination cooking cycle. One combination cooking cycle is 22 seconds.

1. During combination cooking, the digital programmer circuits ON-OFF time of both heater and magnetron shown in Figure.

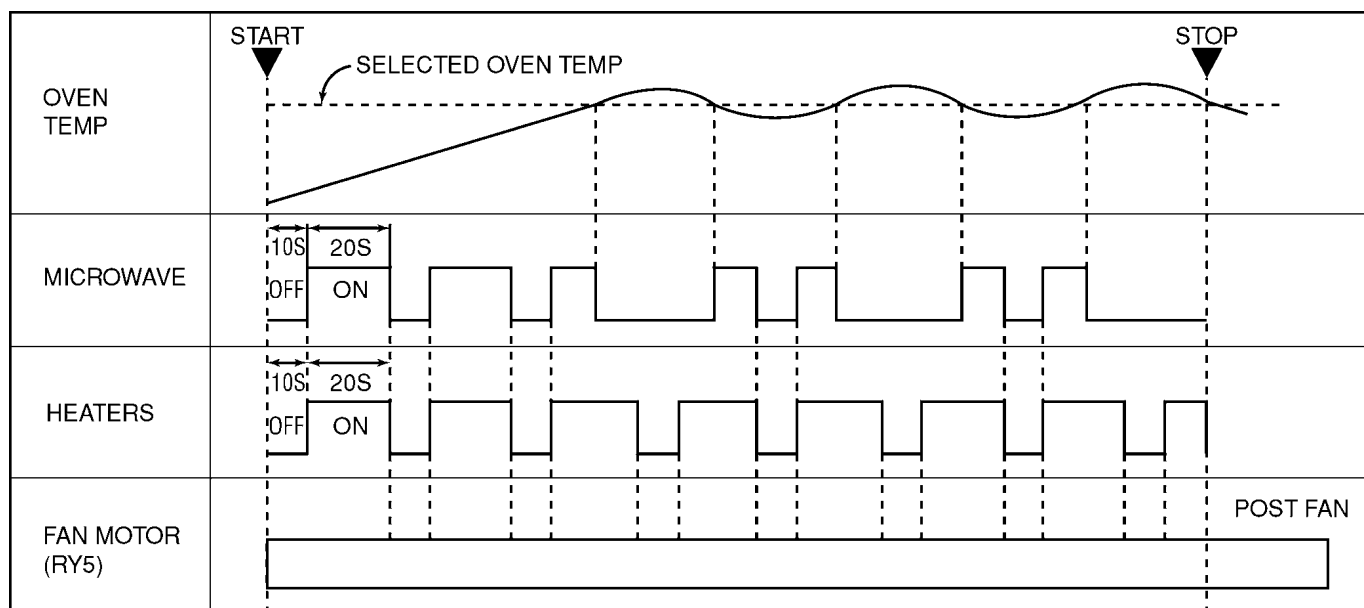
NOTE 1: Note that the heater may not be on during a heater on period if the preprogrammed oven temperature has been reached. This is due to the fact that the oven is keeping the preprogrammed oven temperature constant, so of course

the heater will only be on when it is needed and off when it is not needed.

NOTE 2: As for temperatures of combination cooking for convection, the temperatures by each program are preprogrammed in the microprocessor as shown in Figure.

Combination Cooking

CATEGORY	MICROWAVE	OVEN TEMP
1	20/30 SEC	150°C
2	20/30 SEC	170°C
3	20/30 SEC	200°C



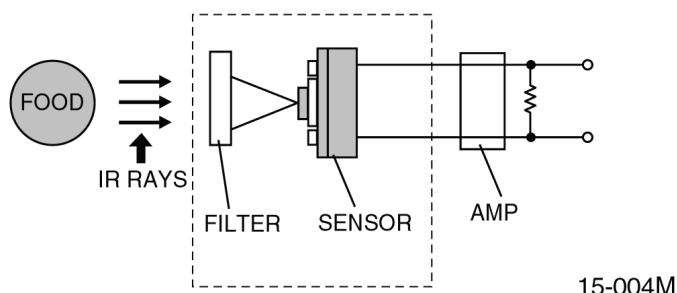
96-028M

5.5. Sensor reheating

The temperature of the foods being heated is detected by an infrared (IR) sensor and you do not have to set the temperature or time.

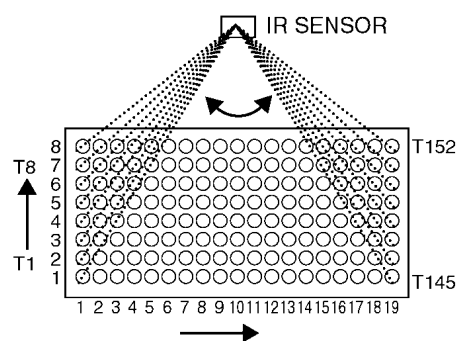
5.5.1. How to read temperature by IR sensor

IR sensor can read food temperature without touching, IR rays emitted from food. IR sensor to generate temperature related electric signal output and micro-computer to convert actual temperature.

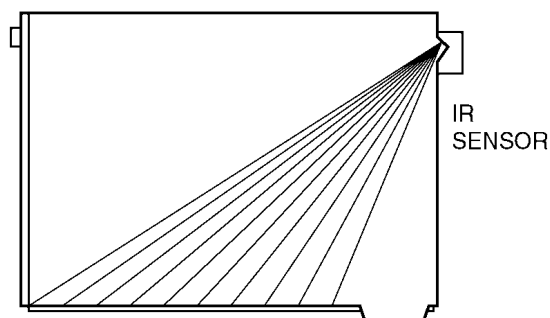


15-004M

read oven shelf front to back at the time. Then IR sensor is design to scan right to left to cover all over shelf. (19 points)



15-005M



15-006M

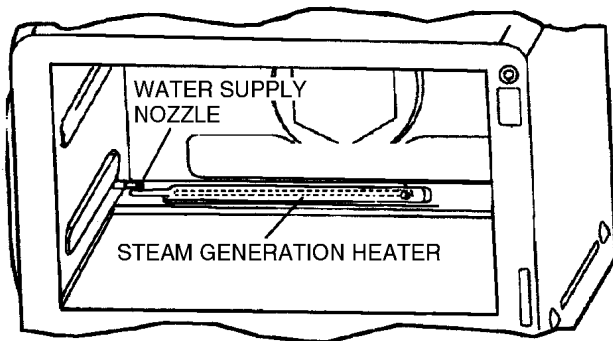
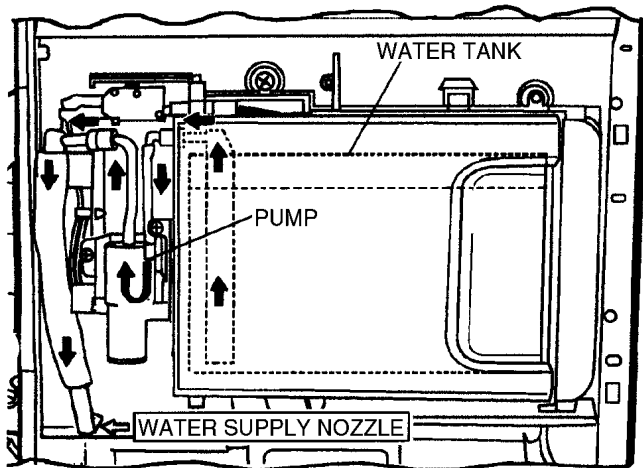
5.5.2. Operation

IR sensor is mounted top back of oven cavity through the hole. It scans all over cooking shelf. IR sensor has 8 eyes and can be

6 STEAM FUNCTION (STEAM & MICRO POWER AND Reheat with STEAM.)

6.1. Water supply

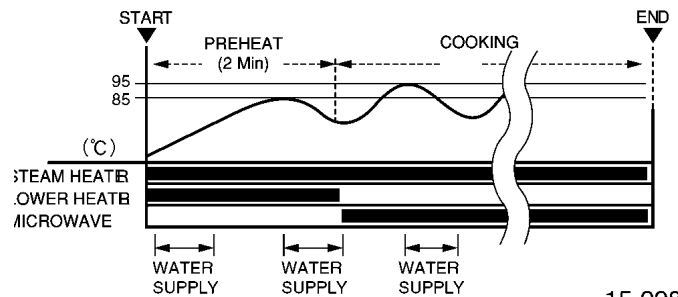
As showing in figure, water in water tank will be pumped up and supply to the steam generation heater located inside back bottom of oven cavity.



15-007M

6.2. Operation

When pushing start bottom, oven preheat will start and then water supply begins. It will take about 2 minutes for pre-heating. When preheat is completed, it will turn into actual cooking process. During heating, temperature sensor located on steam sensor monitoring steam heater temperature and when it exceeds 95C, then additional water to supply to maintain moisture/steam within oven cavity.



15-008

7 CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION

Servicemen should remove their watches whenever working close or replacing the magnetron.

7.1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used when grounded. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

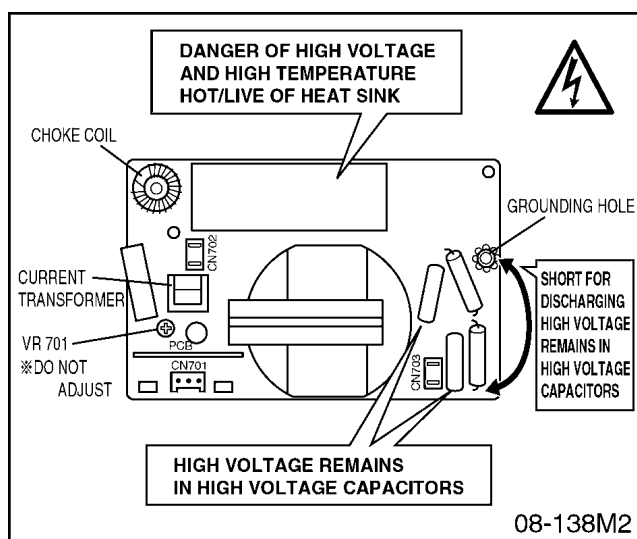
7.2. Inverter Warnings (NEW H.V.)

DANGER OF HIGH VOLTAGE AND HIGH TEMPERATURE (HOT/LIVE) OF THE INVERTER POWER SUPPLY (U)

This High Voltage Inverter Power Supply circuit handles very high voltage and very high current for the magnetron tube. Though it is free from danger in ordinary use, extreme care should be taken during repair. As you can see, it looks like a TV flyback transformer, however the current is extremely large and so danger exists by its high current and high voltages.

The aluminum heat sink is also energized with high voltage (HOT), so do not touch when AC input terminal is connected to the Power line because one of the IGBT switching power devices (Collector) is directly connected to the Aluminum heat sink.

The Aluminum heat sink may be HOT by heat energy; therefore, extreme care should be taken during servicing and replacing.



WARNING OF DISCHARGING HIGH VOLTAGE CAPACITORS

Warning about the electric charge in the high voltage capacitors. For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitors in the inverter power supply circuit board.

When replacing or checking parts, remove the power plug from the outlet and remove air guide cover then short the inverter high voltage diode terminal to the chassis ground with an insulated handle screwdriver to discharge. please make sure to touch chassis ground side first then short to the output terminals.

WARNING

There is high-voltage present, with high-current capabilities in the circuits of the primary, and secondary windings, choke coil and heat sink of the inverter. It is extremely dangerous to work on or near these circuits with oven energized.

DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

WARNING OF INVERTER POWER SUPPLY (U) GROUNDING

Check the High Voltage inverter Power supply circuit grounding. This High Voltage inverter Power supply circuit board must have a proper chassis ground by the grounding bracket to the chassis ground; otherwise, this H.V.inverter circuit board will expose very high voltage and cause extreme DANGER! Be sure to have proper grounding by the grounding plate and screws.

7.3. When parts must be replaced, remove the power plug from the outlet.

7.4. When the 10A/18A 250V fuse is blown due to the operation of short switch:

WARNING

When the 10A/18A 250V. fuse is blown due to the operation of short switch, you must replace Primary latch switch and short switch. Also replace power relay 2 (RY) when the continuity check reads shorted contacts (1-2).

1. This is mandatory. Refer to "Adjustments and Measurement" for these switches.
2. When replacing the fuse, confirm that it has the appropriate

rating for these models.

3. When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

7.5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes gaps, because such objects may work as an antenna and cause microwave leakage.

7.6. Confirm after repair

1. After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing. microwaves might leak if screws are not properly tightened.
2. Make sure that all electrical connections are tight before inserting the plug into the wall outlet.

CAUTION

MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

IMPORTANT NOTICE

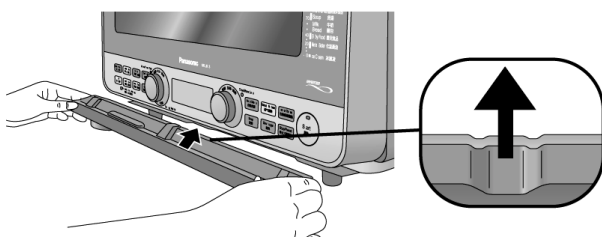
1. The following components have potentials above 250V while the appliance is operated.
 - *Magnetron
 - *Heat sink of H.V.INVERTER (U)
 - *High voltage transformer (H.V.INVERTER(U))
 - *High voltage diode (H.V.INVERTER(U))
 - *High voltage capacitors (H.V.INVERTER(U))
 Pay special attention on these portions.
2. When the appliance is operated with the door hinge or magnetron fixed incorrectly, the microwave leakage can reach more than 5mW/cm². After repair or exchange, it is very important to check if magnetron and the door hinge is correctly fixed.

Care of Your Microwave Oven

1. Turn the oven off and remove the power plug from the wall socket before cleaning.
2. Keep the inside of the oven clean. When food splatters or spilled liquids adhere to oven walls, wipe with a damp cloth. Non caustic oven cleaners may be used if the oven gets very dirty. The use of harsh detergent or abrasives is not recommended.

Note: Do not use oven cleaners on the ceiling of the oven.

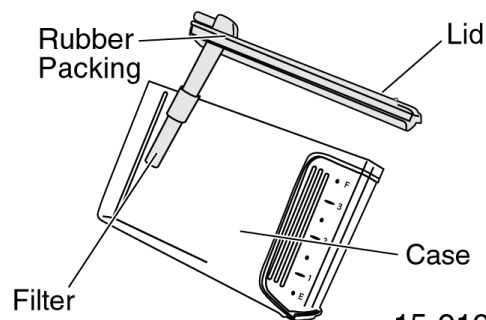
3. The outside oven surfaces should be cleaned with a damp cloth. To prevent damage to the operating parts inside the oven, water should not be allowed to seep into the ventilation openings.
4. Do not allow the Control Panel to become wet. Clean with a soft, damp cloth. Do not use detergents, abrasives or spray-on cleaners on the Control Panel.
When cleaning the Control Panel, leave oven door open to prevent oven from accidentally turning on. After cleaning press Stop/Reset Pad to clear the Display Window.
5. If steam accumulates inside or around the outside of the oven door, wipe with a soft cloth. This may occur when the microwave oven is operated under high humidity conditions and in no way indicates malfunction of the unit.
6. Wash the Metal Tray with a nonabrasive nylon mesh scouring pad and wipe off the water content after each use.
7. Make sure to wash the Water Tank with water and a nonabrasive nylon mesh scouring pad and wipe off the water content at least once a week. Do not use dish washer or dish dryer for washing. Otherwise, deformation or damage may be caused.
8. Remove the Collector Pan by pulling it toward you and wash it with water and a nonabrasive nylon mesh scouring pad.
After wiping off the water content, refit the Collector Pan by aligning the center of it with the center of the main unit as shown in the figure below.



15-009M

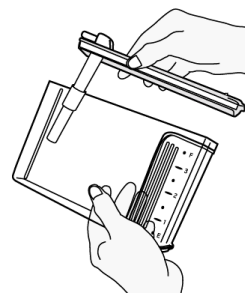
Water Tank:

Ensure to take care of it after using.



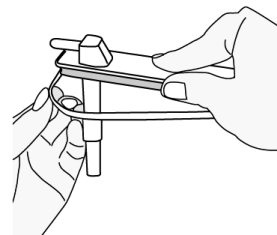
15-010M

1. Place your finger onto the convexity of the lid to remove it.



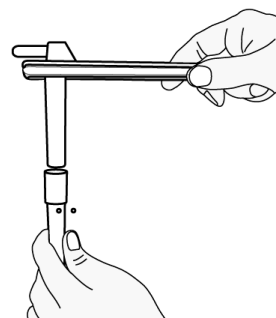
15-011M

2. Remove the Rubber and rinse it using a soft sponge.



15-012M

3. Unscrew the Filter and remove it. Rinse it using a soft sponge.



15-013M

4. Rinse the inside of the Filter.
5. Fit the tip of the Filter.
6. Rinse the Case using a soft sponge.

NOTES:

1. The structure allows the water remaining in the main unit to be automatically drained into the Water Pallet, when the Water Tank is removed. After the draining, wipe off the rest of the water.
2. Do not use dish washers or dish driers. Otherwise, the Water Tank will be deformed.

Maintenance using keys:

You can use 17 through 19 in the Auto Menu to maintain the inside of the oven. Perform these operations with the unit plugged in.

17 Deodorization

Burns out worrying odor inside of the oven.

1. Remove the Metal Tray. Wipe off any dirt inside of the oven.
2. Press the Auto Menu Pad. Select "17 Deodorization" with the Menu/Power/Temp./Serving/Weight Select Dial.
3. Press the Start Pad.
It takes 20 minutes for this process.

18 Cavity

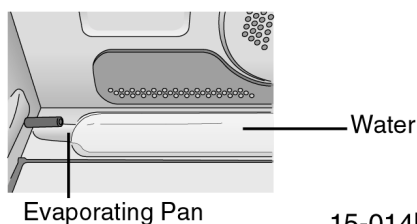
Generates steam to enable dirt on the inner walls of the oven to be wiped off easily.

1. Pour pure/distilled water in the Water Tank and position the Water Tank in the main unit. Remove the Metal Tray. Wipe off any dirt inside of the oven.
2. Press the Auto Menu Pad. Select "18 Cavity" with the Menu/Power/Temp./Serving/Weight Select Dial.
3. Press the Start Pad.
4. After completion, plug it out and allow the inside of the oven to cool down. Then, wipe out with a damp cloth.
It takes 20 minutes for this process.

19 Evaporating Pan

Remove dirt (water stain, etc.) in the Evaporating Pan. Use citric acid diluted with water. Purchase citric acid at a pharmacy. When it doesn't have citric acid, it can be substituted with lemon juice.

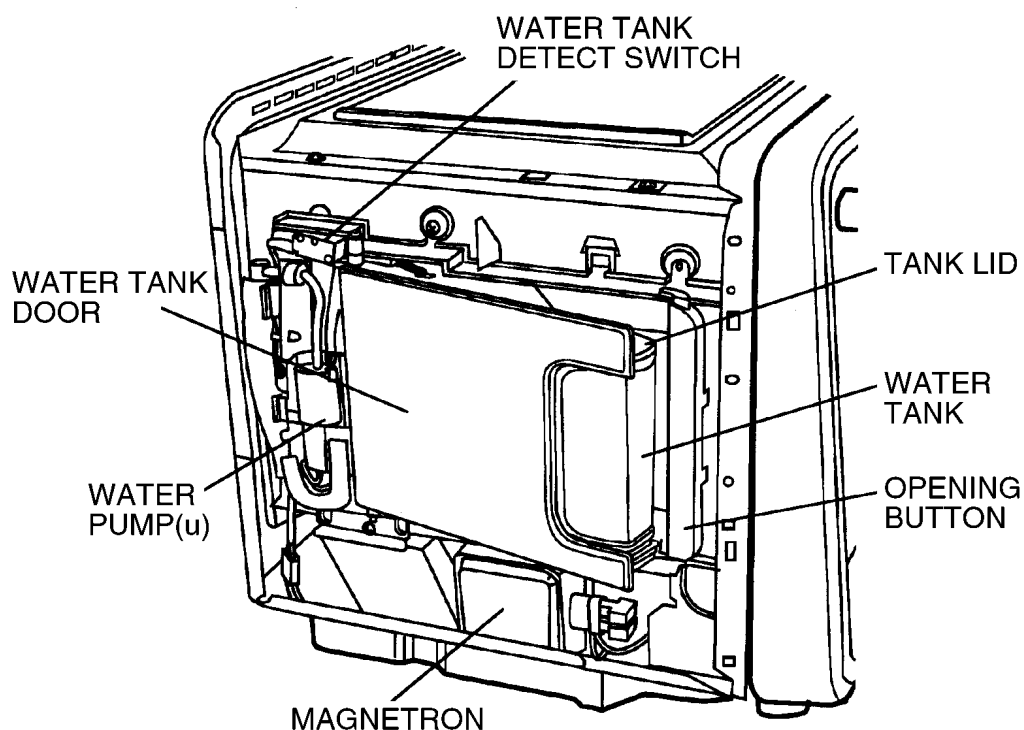
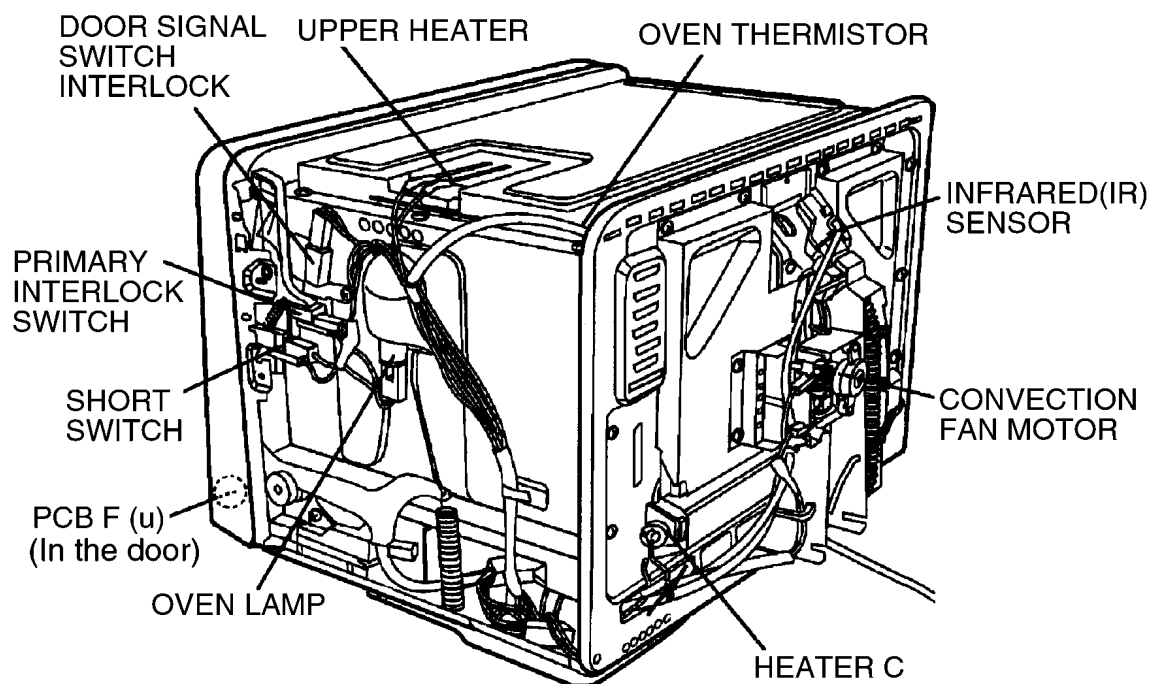
1. Remove the Metal Tray. Remove the Water Tank and the Ceramic Plate.
2. Open the Lid of the Water Tank and pour pure/distilled water to the "F" (FULL) mark (320 ml) of the tank. Close the Lid.
3. Pour the solution of pure water of 40 ml mixed with citric acid of approx. 3 g into the Evaporating Pan.



4. Position the Ceramic Cover in the Evaporating Pan.
5. Press the Auto Menu Pad. Select "19 Evaporating Pan" with the Menu/Power/Temp./Serving/Weight Select Dial.
6. Press the Start Pad.

7. After completion, allow the inside of the oven to cool down. Then, remove the Ceramic Cover to wash them. Wipe off water in the Evaporating Pan.
8. If you are nervous about the smell of citric acid, repeat Steps 1 through 8 by pouring pure water alone into the Evaporating Pan.
It takes 20 minutes for this procedure.

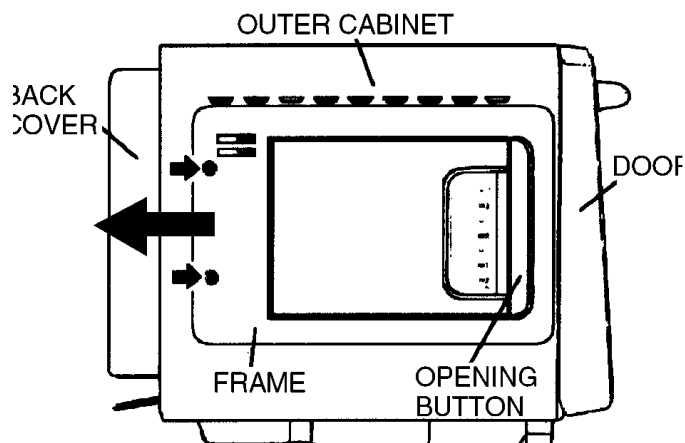
8 DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE



8.1. Inverter PCB

* When removing cabinet, unplug and wait for 30 seconds then discharge high voltage remaining in high voltage capacitor.

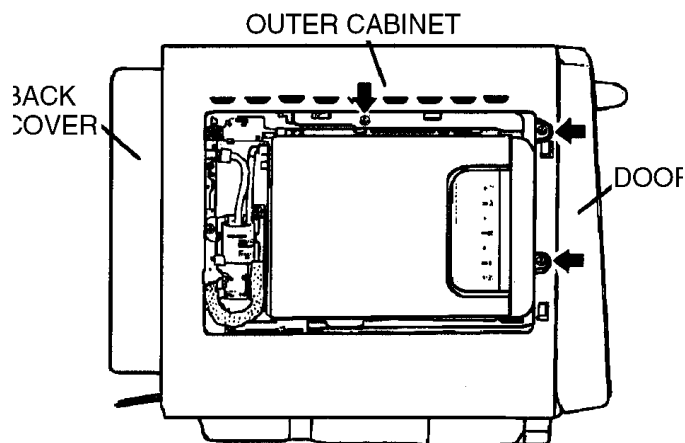
1. Remove frame (Remove 2 screws to slide out.).



15-015M

2. Remove outer cabinet (9 screws).

Including 3 screws on left side as below.

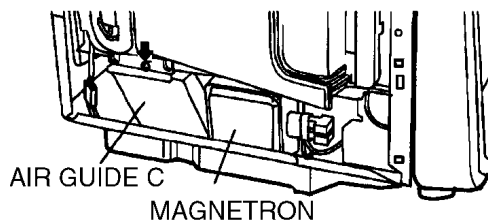


15-016M

3. Remove a screw on air guide C.

4. Disconnect 2 lead wires on magnetron.

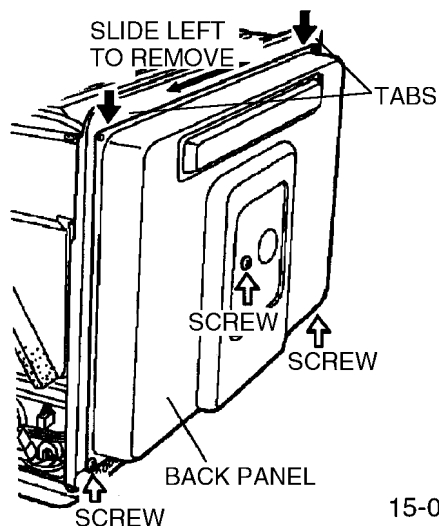
5. Disconnect 4 pin (pump) connector.



15-017M

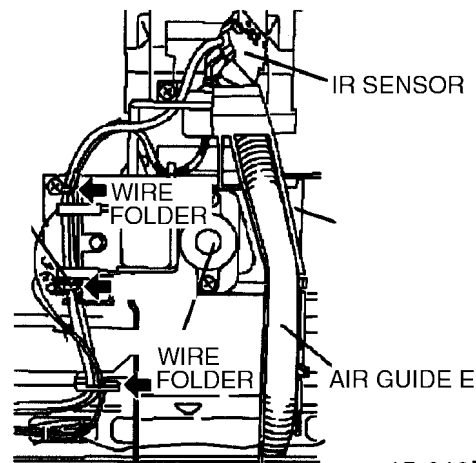
6. Remove ceramic cover from oven cavity.

7. Remove back panel (3 screws).



15-018M

8. Remove air guide E.



15-019M

10. Turn up side down oven.

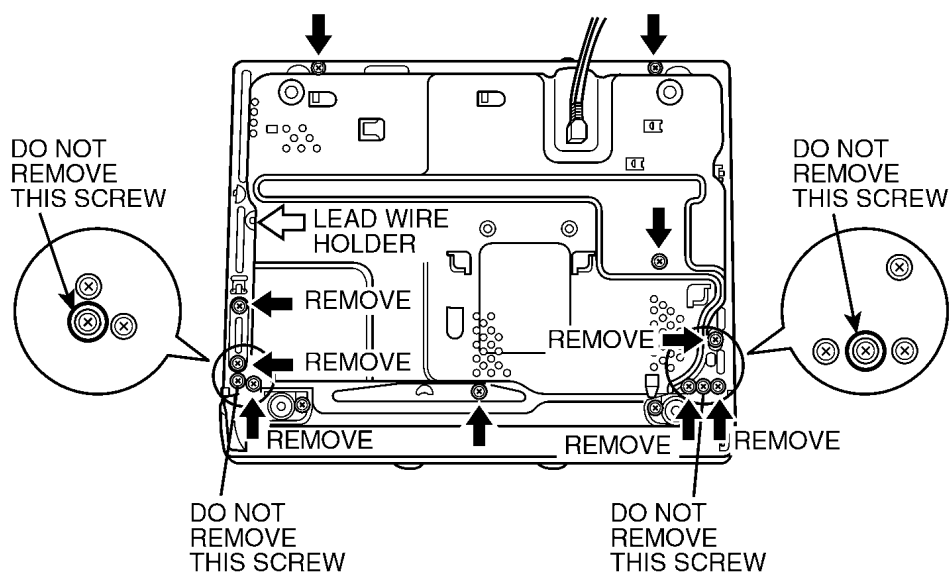
11. Remove door spring and door arm.

When re-assemble oven make sure to snap in holder.

13. a. Remove base cover first (3 screws).

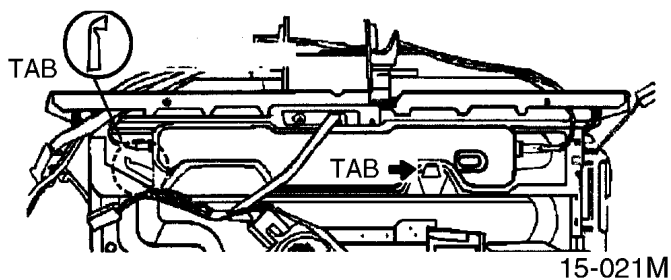
b. Do not remove one each hinge screw which direct mount to oven cavity unless you must re-adjust door again.

c. Remove noise filter unit mounting 7 screws and release one lead wire connector).



15-020M

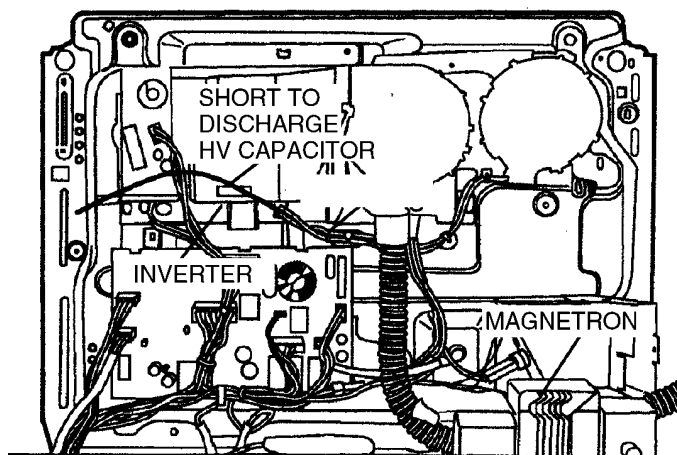
14. Carefully pull up base plate from front side, bent holding tab as shown in figure.



15-021M

15. Stand base plate by holding tabs

Warning: Any lead wire should not be caught by base.

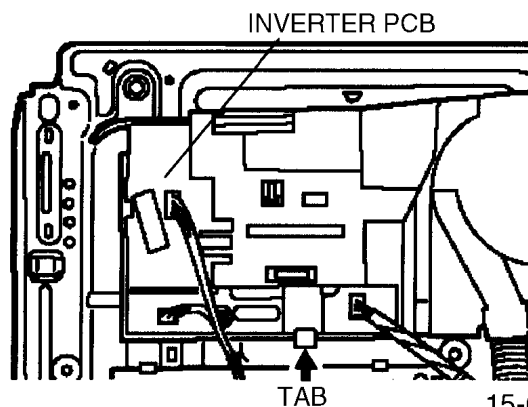


15-022M

16. Discharging high voltage by shorting high voltage terminal to chassis ground.

WARNIG: Touch chassis side first.

17. Release 2 tabs to open air guide.

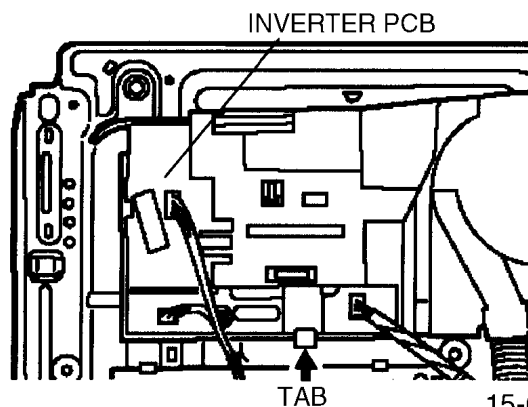


15-023M

18. Inverter PCB

1. Release CN701/CN702/CN703 connectors
2. Remove 2 screws
3. Remove 2 tabs to remove inverter

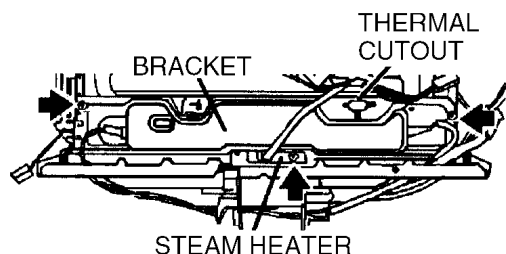
WARNING: Make sure put back grounding screw when re-assemble



15-023M

8.2. Steam heater

1. Follow inverter PCB removing steps 1-16.
2. Release 2 lead wire from thermal cutout.
3. Release steam heater terminal lead wire (2).
4. Release antenna motor lead wire connector
5. Remove steam thermistor (1 screw)
6. Remove bracket.

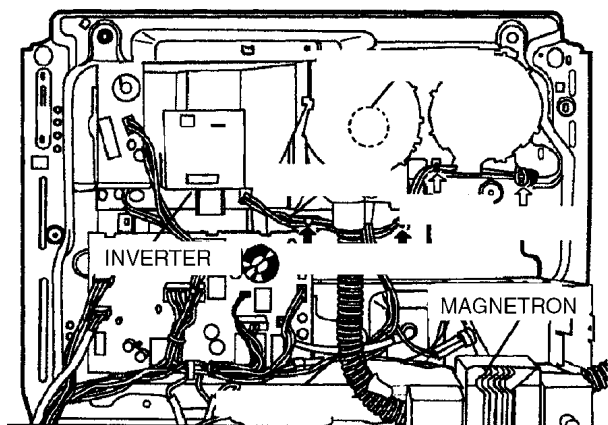


15-025M

7. Remove steam heater.

8.3. DPC

1. Follow inverter PCB removing steps 1-16 first.
2. Remove all wiring connectors.
 - a. Remove 13 connectors.
 - b. Remove grounding lead wire (2 screws).
 - c. Release tabs to remove PCB.

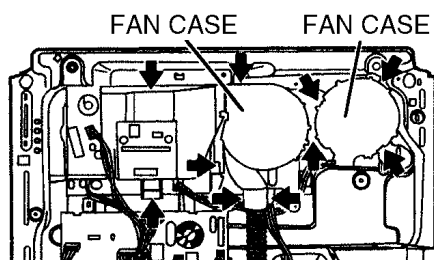


15-026M

NOTE: One lead wire connector from DPC is not connected any place, but this is normal, after replacing, make sure not touching or caught any portion.

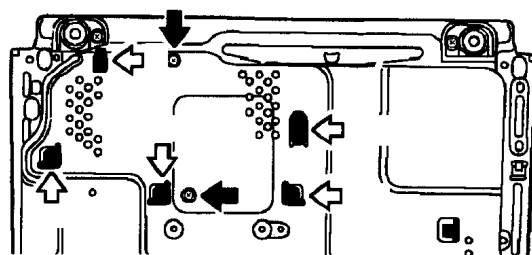
8.4. Fan motor

1. Follow inverter PCB removing steps 1-16 first.
2. Remove Fan case.



15-027M

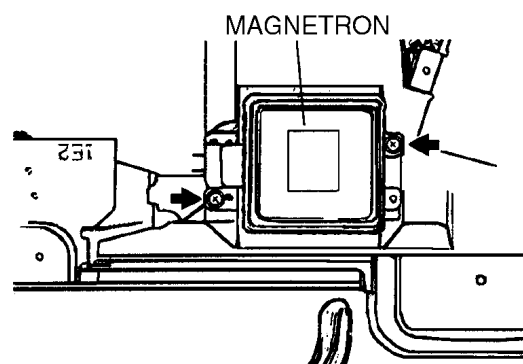
3. Remove fan motor unit.
 - a. Remove 2 screws.
 - b. Release holding tabs.



15-028M

8.5. Magnetron

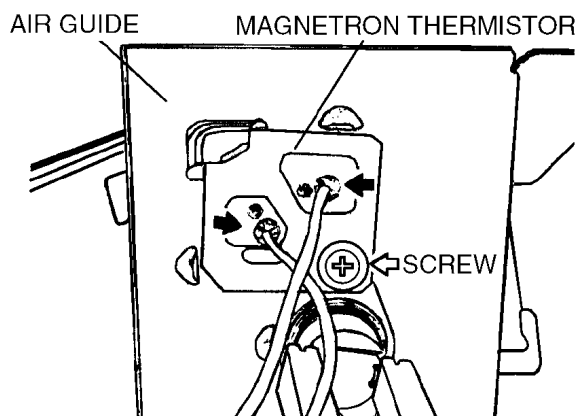
1. Follow inverter PCB removing steps 1-16 first.
2. Remove magnetron (3 screws).



15-029M

8.6. Magnetron Thermistor

1. Follow inverter PCB removing steps 1-16 first.
2. Remove magnetron thermistor.
 - a. Unsolder lead wire.



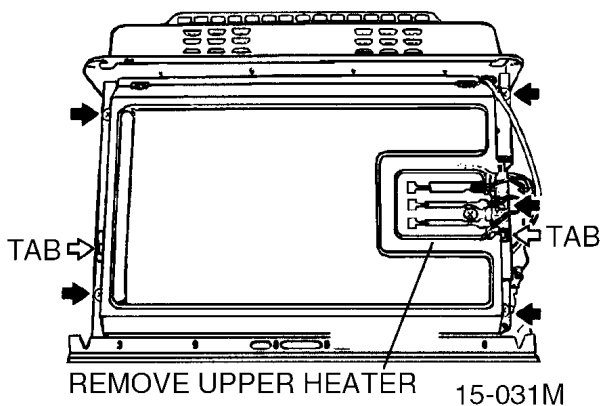
15-030M

- b. Remove screw

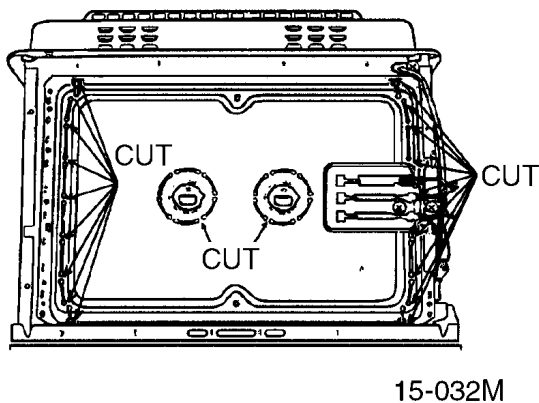
8.7. Upper heater

8.7.1. Remove upper heater

1. Remove frame (2 screws).
2. Remove outer cabinet (9+3 screws).
3. Remove lead wire terminal.
4. Remove adiabatic material.
 - a. Remove 5 screws.
 - b. Straight vending tabs.

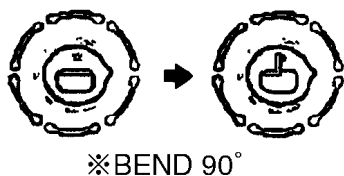


5. Remove upper heater
 - a. Remove heater terminal board.
 - b. Cut where marked.



8.7.2. Replace upper heater

1. Place new heater and vend tabs in 90° to secure heater.



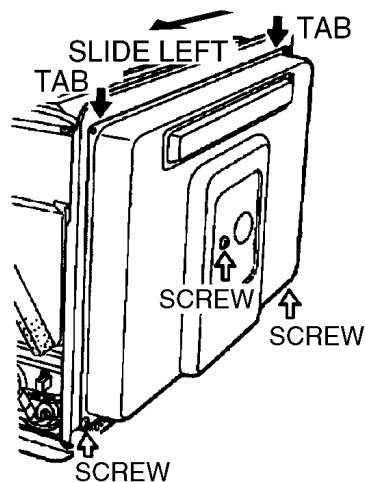
15-033M

2. Secure terminal board.

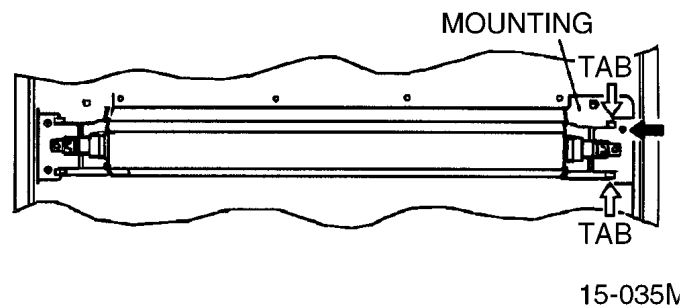
8.8. Back Heater

1. Remove frame.
2. Remove outer cabinet.
3. Remove back cover.

Slide left to remove.



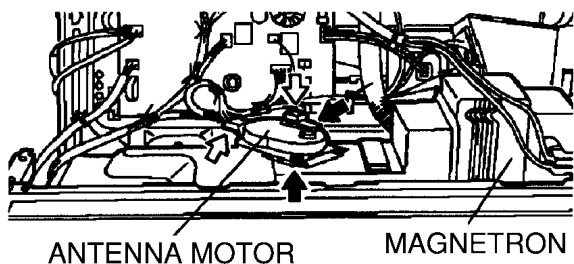
4. Remove heater.
 - a. Remove lead wires
 - b. Straight the tabs.
 - c. Remove screw.
 - d. Remove mounting plate.



- e. Remove heater.

8.9. Antenna motor

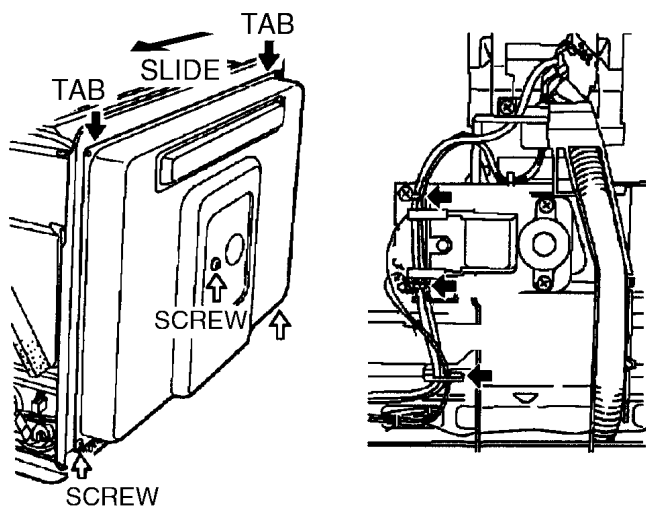
1. Follow inverter PCB removing steps 1-16 first.
2. Unplug connector.
3. Remove screws.



15-036M

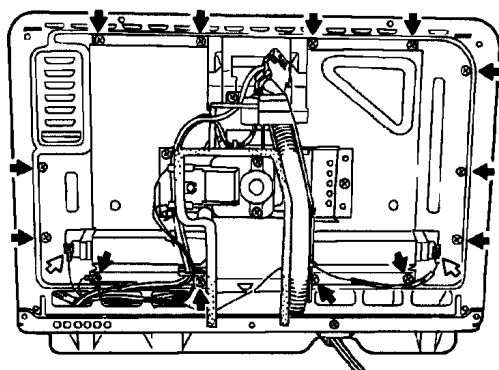
8.10. Convection fan motor

1. Remove frame.
2. Remove cabinet.
3. Remove back panel.



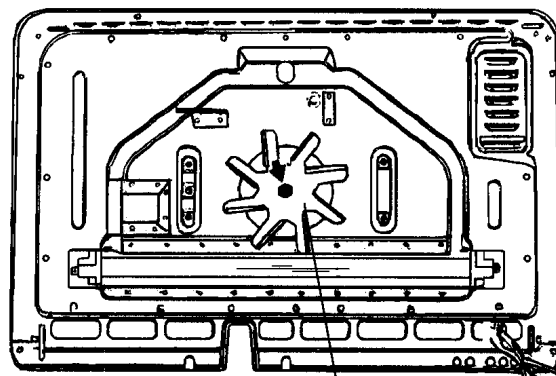
15-037M

4. Remove back panel (inner) (11 screws).



15-038M

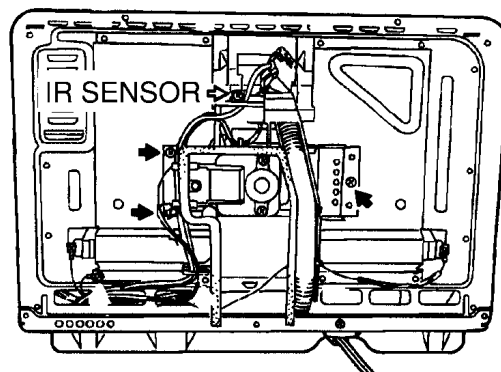
5. Remove fan blade (M4 nut + spring washer).



CONVECTION FAN

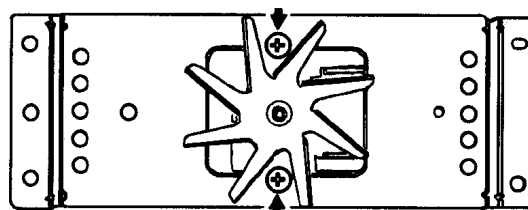
15-039M

6. Remove IR sensor.
7. Remove barcket.
- a. Remove lead wire connector.



15-040M

8. Remove cooling fan.
9. Remove motor.



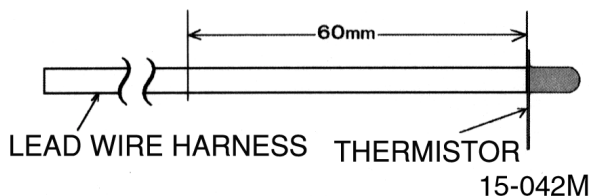
15-041M

8.11. Oven thermistor

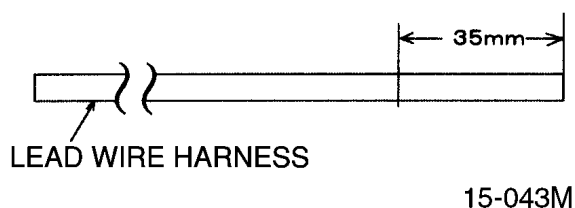
NOTE: If you are doubt about following pocedures please replace by whole lead wire harness.

Replace thermistor.

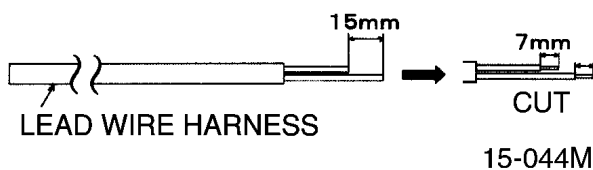
1. Remove screw.
2. Cut lead wire at 60mm.



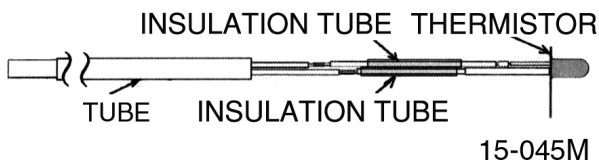
3. Cut tube in 35mm.
- Do not cut lead wires.



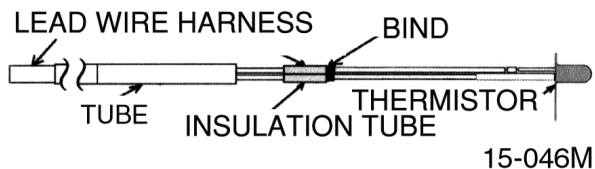
4. 15mm short cut one side lead wire and remove insulation in 7mm.



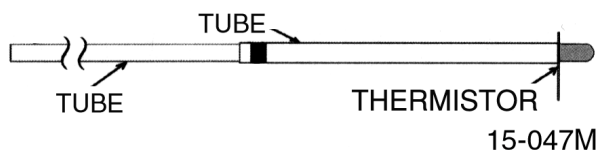
5. Insert insulation and solder connection of new thermistor.



- a. After soldering lead wires make sure isolated by insulation tube and bind them together.

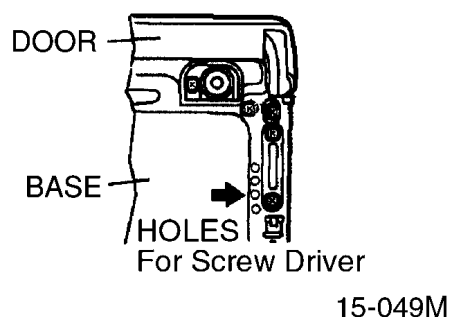
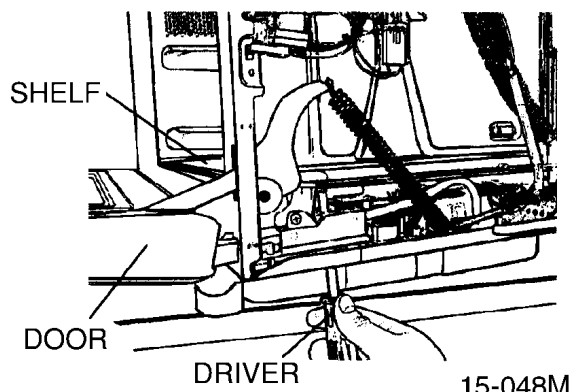


6. Insert tube for secure insulation.

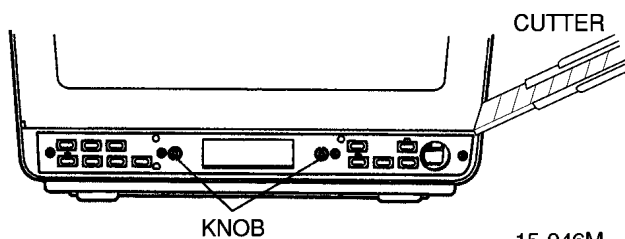


8.12. Shelf

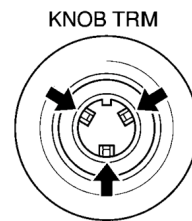
1. Remove frame
2. Remove outer cabinet
3. Locate oven just off the table and insert screw driver to push up.



8.13. Door Parts

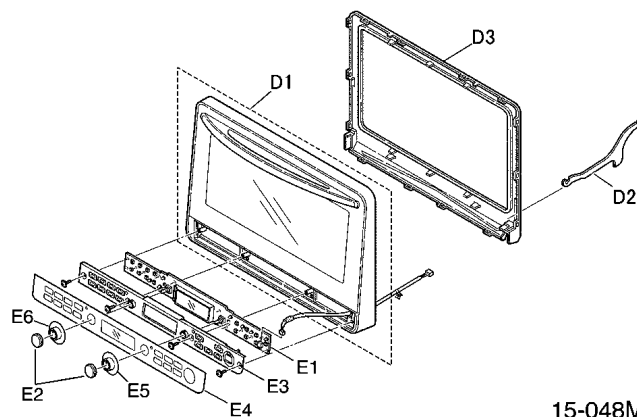


15-046M



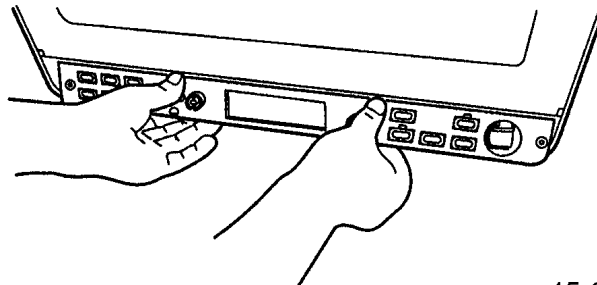
15-047M

1. Remove 2 knobs (E2).
2. Remove knob trim (E5 & E6) by releasing 3 hooks inside hole.
3. Use cutter blade or like to pick up escutcheon sheet edge to start peel off where you can find gap between door and escutcheon sheet. Right or left edge is most convenient to start peeling off.



15-048M

4. To remove escutcheon or printed circuit board remove 4 screw to release from door U.



15-049M

9 COMPONENT TEST PROCEDURE

DANGER NEW H.V.

1. High voltage is present at the high voltage terminal of the High Voltage Inverter (U) including aluminum heat sink during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

9.1. Primary Latch switch, Secondary (Secondary Latch Switch and Power Relay 2) Interlocks.

1. Unplug the lead connectors to Power Relay 2 verify continuity of the power relay 2 1-2 terminals.
2. Unplug lead connectors to Primary Latch Switch and secondary Latch Switch.
3. Test the continuity of switches at door opened and closed positions with ohm meter (low scale).

Normal continuity readings should be as follows.

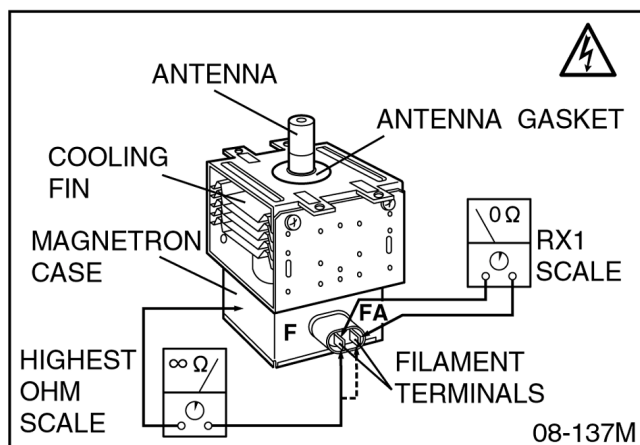
	Door Opened	Door Closed
Primary Latch Switch	$\infty \Omega$ (open)	0 Ω (close)
Secondary Latch Switch	$\infty \Omega$ (open)	0 Ω (close)
Power Relay 2	$\infty \Omega$ (open)	$\infty \Omega$ (open)

9.2. Short Switch / Monitor Circuit

1. Unplug lead wires from H. V. Inverter primary terminals.
2. Connect test probes of ohm meter to the disconnected leads which were connected to H. V. Inverter.
3. Test the continuity of short switch with door opened and closed positions using lowest scale of the ohm meter.

Normal continuity readings should be as follows.

Door Opened	Door Closed
0 Ω	$\infty \Omega$



9.3. Magnetron (NEW H.V.)

Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.

1. Isolate magnetron from the circuit by disconnecting the leads.
2. A continuity check across magnetron filament terminals should indicate one ohm or less.
3. A continuity check between each filament terminal and magnetron case should read open.

NOTE

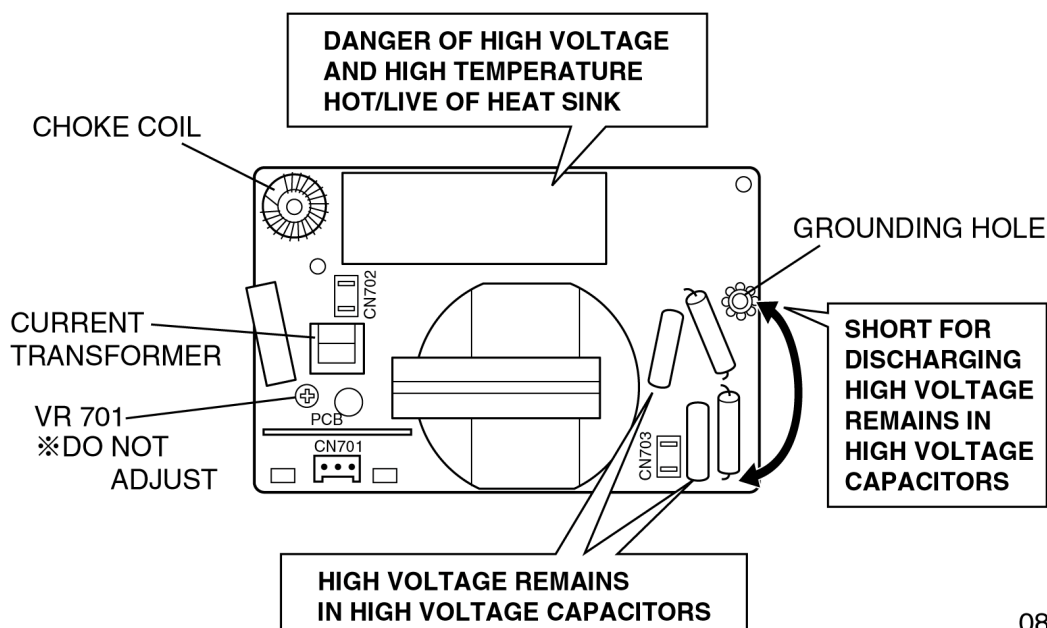
Magnetron used for this model is unique type for inverter power supply system. Make sure to use the one as listed in the part list.

9.4. Inverter Power supply (U) (NEW H.V.)

Replace as whole H.V. Inverter (U) Unit.

DO NOT try to REPAIR this H.V. Inverter power supply (U).

Refer to warning on page 2.



08-145M

9.5. Inverter Power Supply (U) (NEW H.V.)

DANGER HIGH VOLTAGE

Test 1

- Place 1 liter of water load into oven cavity.
- Unplug 2 pin H.V. lead wire connector CN703 from magnetron tube.
- Program oven at High power for 1 minute and press start.
 - After approx. 23 seconds, oven stops.
 - During oven operation, input current is approx. at 0.5 to 1.0A. For 110v model and 0.2 to 0.5A for 220/240V models. If input current is OK, please proceed to test 2.

	INPUT AMPARE	SYMPTOM
Unplug CN703	0.5 to 1A (For 110 V model) 0.2 to 0.5A (For 220/240 V model)	Oven stops in 23 seconds after stated.

Test 2

	INPUT AMPARE	SYMPTOM
Unplug CN701	less than 0.4A (For 110 V model) less than 0.2A (For 220/240 V model)	Oven stops in 3 seconds after stated.

If both 1 and 2 are OK, the Inverter Power Supply (U) can be determined OK.

9.6. Temperature thermistor

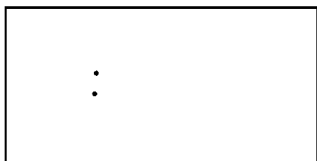
Those sensor monitors the heat produced by the heater circuit and maintains the oven temperature which user had selected. Normal room temperature of 10°C to 30°C, the reading across the thermistor should be as follows.

TEMP	MAGNETRON THERMISTOR	STEAM THERMISTOR	OVEN THERMISTOR
100°C	30-60KΩ	10-20KΩ	10-20KΩ
25°C	700K-1.5MΩ	100K-300KΩ	100K-300KΩ

If the resistance reading is out of the range stated here, the sensor is defective and must be replaced.

9.7. How to Set Test Mode

1. Plug-in oven.



2. Press **STOP/RESET** button more than 2 second until beeper beeps.

3. Then press **STOP/RESET** button 2 times

oven will show;

-16	110V 60Hz Model WTT
-25	220V 50Hz Model HPE,TPE,XPE
-26	220V 60Hz Model LPK
-45	240V 50Hz Model MPQ,YPQ

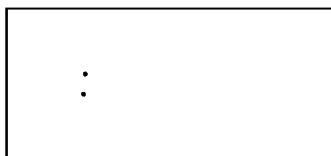
↑
Model ID

4. To cancel test mode.
Unplug oven and wait for 10 seconds.

9.8. IR Sensor

Test IR sensor by following steps

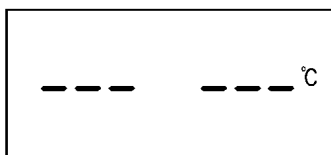
1. Plug in oven



Pour hot water into relatively larger tray and placed center

2. Open the door, while remaining open, press **START** button for more than 2 seconds — one beep announced

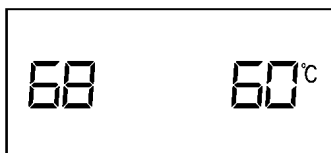
3. Remain open door and press **START** 2 times



4. Close door

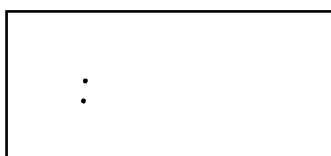
5. Press **START** button

IR sensor moves and stop at center after 4 seconds



It shows max and minimum temperature reading of 8 eyes IR sensor

6. Press **STOP/RESET**



If above is ok, IR sensor functions properly

9.9. Microwave Oscillation Test

note : testing microwave mode always place a cup of water

1. Starting with test mode

display such as;

-16, -25, -26, -45

2. Press **STOP/RESET** button

1 beep

3. Press **SOUP** button

You must press soup button within 5 seconds

after pressed **STOP/RESET** button

If not appear 9FF , press **STOP/RESET** again and press

SOUP button.

9FF.....Now you may push **START** For 1000w power

Input ampares of about 7.5A(220V model)

* For 110v model it will be about 15A

- Repeat steps 2 and 3 then;

4. Turn menu/power/temp knob one click left

8FF.....You may start 700W power input, Ampares

about 5.3A(220V)

1FF.....You may start 200W power input, Ampares

about 2.0A(220V)

If the above input ampere is ok,

You may decide microwave function is

working in order.

Input ampares will vary by input supply voltage

and also differ how long oven kept run.

9.10. Heater Test

Top heater back heater steam heater

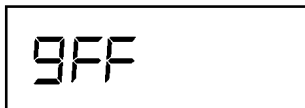
1.Starting with test mode

-16 , -25 , -26 , -45-----Model ID

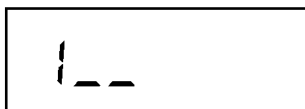
2.Press **STOP/RESET** button pressed
1 beep

3.Press **SOUP** button

You must press **SOUP** button within 5 seconds
after pressed **STOP/RESET** button



4.Press **SOUP** button



5.Press **START** button

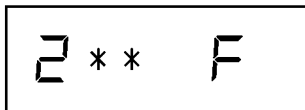
⚠ WARNING

Do not keep run Heater, Unless Oven will smoke.
To check, Watch Ampare meter and Press start in every
second and Should be finished test in a Ten seconds.



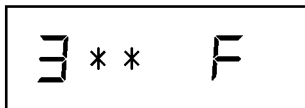
- Upper & Steam Heater turns on
5.8A/240V

6.Press **START** button



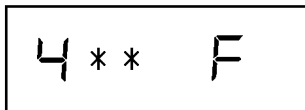
- Convection Heater turns on
4.5A/240V

7.Press **START** button



- Steam Heater turns on
2.8A/240V

8.Press **START** button



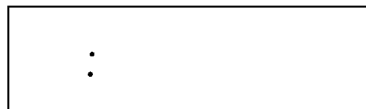
- Upper Heater turns on
2.8A/240V

9.Press **START** button

If any above steps input ampere is missing or lower
please check related heater and its connection

9.11. AC Line Voltage Standard Adjust You Must Conduct This Procedure When Replacing IR Sensor.

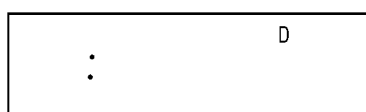
1.Prug - in oven



2.Press **MICRO POWER** button for more than 2 seconds
1 beeps

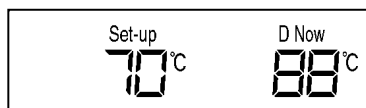


3.Press **MICRO POWER** button 3 times



..... D for store
demonstration mode.
Display will switch
time to time.

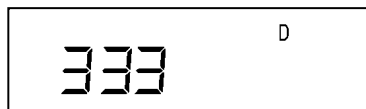
4.Press **START** button



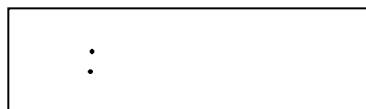
5.Press **STOP/RESET** button for more than 2 seconds
1 beeps

6.Press **STOP/RESET** button 3 times

When 3rd time pressed, one beep will announced



7.Press **STOP/RESET** button



Demo (Demonstration) Mode will be cancelled

10 MEASUREMENTS AND ADJUSTMENTS

10.1. Adjustment of Primary latch switch, Secondary latch switch and short switch

1. When mounting primary latch switch, secondary latch switch and short switch to door hook assembly, mount the primary latch switch, the Secondary latch switch and the short switch to the door assembly as shown in table.

NOTE: No specific adjustment during installation of Primary latch switch, Secondary latch switch and short switch to the door hook is necessary.

2. When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of arrow in table so that the oven door will not have any play in it. Check for play in the door by pulling the smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.

3. Reconnect the short switch and check the continuity of the monitor circuit and all latch switches again by following the components thst procedures.

10.2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test produres, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

*1 liter beaker *Glass thermometer

*Wrist watch or stopwatch

NOTE 1: Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.

NOTE 2: When measureing output, make sure unplug oven at once for 10 seconds and set maximum power setting. unless output result will be lower.

NOTE 3: Make sure once unplug oven before conducting output test, since after warm upped oven, it may not come out full output power. Unplug to reset power down function.

1. Fill the beaker with exactly one liter of tap water. stir the water using the thermometer and record the beaker's temperature (recorded as T1).

2. Place the beaker on the center of glass cook plate. Set the oven for High power and heat it for exactly one minute.

3. Stir the water again and read the temperature of the beaker (recorded as T2).

4. The normal temperature rise at High power position for each models is as shown in table.

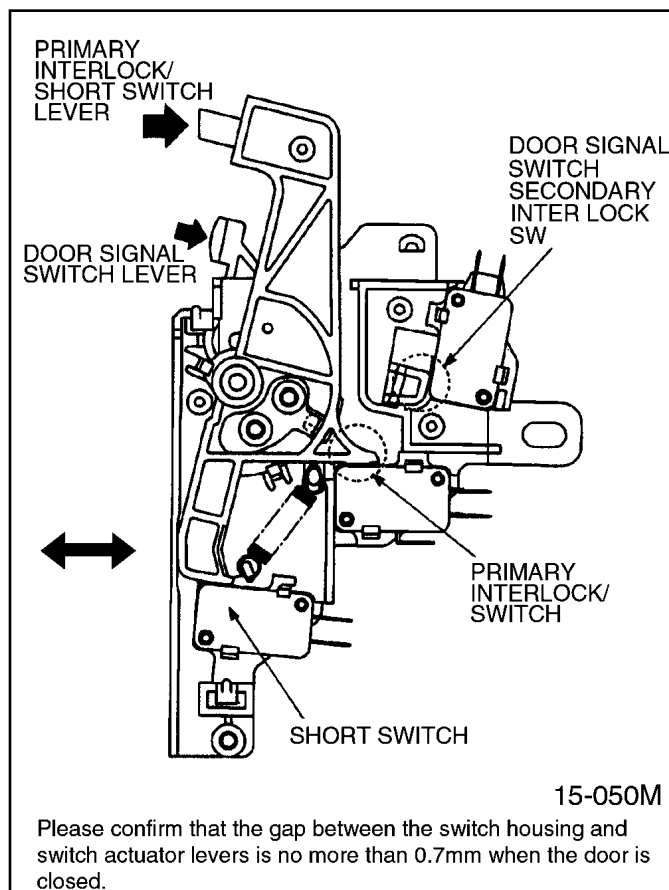


TABLE (1ℓ -1 min. test)

RETED OUTPUT	TEMPERATURE RISE
1000W (IEC705-88)	Min. 8.6°C

11 TROUBLESHOOTING GUIDE (NEW H.V.)

DANGER HIGH VOLTAGE

1. **DO NOT RE-ADJUST PRESET VOLUME on the H.V. Inverter (U).** It is very dangerous to repair or adjust without sufficient test equipment because this circuit handles very large current with very high voltage. Off alignment of inverter board operation will be dangerous.
2. Ensure proper grounding before checking for trouble.
3. Be careful of the high voltage circuitry, taking necessary precautions when troubleshooting.
4. Discharge high voltage remains in the H.V. Inverter (U).
5. When checking the continuity of the switches or the H.V. Inverter, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter. When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the read wire and then disconnect it, otherwise lead wire may be open or the connector cannot be removed.
6. Do not touch any parts or the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel. Always touch yourself to ground while working on this panel to discharge any static charge in your body.
7. 110/220/230/240V AC is present on the digital programmer circuit (Terminals of power relay's and primary circuit of Digital Programmer Circuit. When Troubleshooting, be cautious of possible electrical shock hazard.

Before troubleshooting, operate the microwave oven following the correct operating procedures in the instruction manual in order to find the exact cause of any trouble, since operator error may be mistaken for the oven's malfunction.

Self diagnostic display

Oven has self diagnostic function but it will not appears in normal operation mode.

To shows self diagnostic result please follow step below.

1. Plug-in mode or **•:•** display time to start
2. Push **MICRO-POWER** more than 2 seconds
3. Wait until 2 beeps
4. Push **START** 3 times
5. If any fault was observed it will be keep memorize up to 3 faults in the past.
If more than 4 cases it will renew latest 3 failure codes
Push **START** again one more older error code.
If the oven is operating ok it will show 000 and brinking
6. Error code list
 - H** Hardware problem. Oven itself has problem.
 - U** Usage problem such as run out water and oven itself is works fine.

Error code	Cause of error
H99	Inverter on/off control error
H98	Inverter no magnetron oscillation error
H97	Inverter input error
H96	Inverter custom IC error
H94	Heater operation
H68	IR sensor failure
H61	IR thermistor open/short
H60	IR sensor error
H44	Key board sw failure (short)
H39	Steam thermistor failure
H32	Magnetron thermistor failure
H30	Temperature thermistor open/short
H02	Memory IC error(it can shows up both in test mode and cooking mode)
H20	Steam heater open error
Usage problem	
U14	No water during steam cooking
U40	No load operation
U65	Power down control by magnetron thermister
Hot	It is able to shows up both in test mode of cooking mode

(Trouble 1) Oven stops operation during cooking

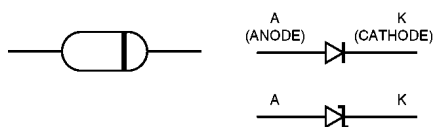
	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven stops in <u>3 seconds</u> after pressing start pad	No input AC voltage is supplied to H.V. Inverter (U) CN702 terminals	1. Latch Switch 2. Power relay RY-2 3. Loose lead wire connector CN702
	Oven stops in <u>23 seconds</u> after pressing start pad	H.V. Inverter (U) operates by the control signals from DPC but magnetron is not oscillating	1. Magnetron 2. Loose lead wire connector CN701, CN703
	Oven stops in <u>10 seconds</u> after pressing start pad (Auto sensor cooking)	Steam sensor circuit is not functions	1. Steam sensor 2. DPC 3. Loose wiring connector
	Oven stops in <u>4 minutes</u> after pressing start pad	Oven temperature sensor circuit is not functions	1. Oven temp. sensor 2. Loose wiring
2.	Oven stops in random time after pressing start pad	Most probably loose connection of connectors or door latch mechanism is not adjusted properly	1. Align door, Door Latch Switches 2. Loose wiring connectors

(Trouble 2) Other troubles

	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness 2. Open thermal cutout 3. Defective DPC	Check fan motor when thermal cutout is defective.
2.	No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective short switch (NOTE 1) 4. Defective H.V. Inverter power supply (U)  Refer to component test procedure NOTE 1: All of these switches must be replaced at the same time. (Refer to adjustment instructions.) Check continuity of power relay 1«s contacts (between 1 and 2) and if it has continuity, replace power relay 1 also.	Check adjustment of primary, secondary latch switch and short switch including door. Refer to inverter PCB Troubleshooting
3.	Oven does not accept key input (Program).	1. Key input is not in sequence 2. Open or loose connection between DPC and PCB F (u) in the door 3. Shorted or open circuit 4. Defective DPC	Refer to operation procedure.
4.	Oven lamp and fan motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch 2. Defective secondary latch switch	Adjust door and latch switches.
5.	Timer starts count down but no microwave oscillation. (No heat while oven lamp and fan motor turn on)	1. Off-alignment of latch switches 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Contact resistance (even 0.1 ohm) will bring lower magnetron filament voltage and cause magnetron to have lower output and/or be intermittent. 3. Defective high voltage component  H.V. Inverter (U)  Magnetron 4. Open or loose wiring of power relay 2 5. Defective primary latch switch 6. Defective power relay 2 or DPC	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if it is defective.
6.	Oven can program but timer does not start countdown.	1. Open or loose wiring of secondary latch switch 2. Off-alignment of secondary latch switch 3. Defective secondary latch switch	Adjust door and latch switches.
7.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage 2. Open or loose wiring of magnetron filament circuit (Intermittent oscillation) 3. Aging change of magnetron	Consult electrician.
8.	Loud buzzing noise can be heard.	1. Loose fan and fan motor	
9.	Heater does not turn on.	1. Defective heater 2. Defective DPC	

12 HOW TO CHECK THE SEMICONDUCTORS USING AN OHM METER

Diode



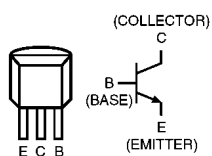
	FORWARD	REVERSE
A-K	SMALL	∞

Transistor

NPN Transistor

2SC

2SD

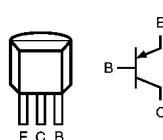


	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

PNP Transistor

2SA

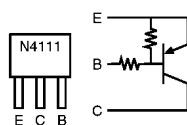
2SB



	FORWARD	REVERSE
B-E	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

Digital Transistor

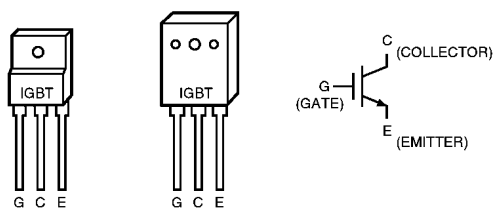
PNP Transistor



	FORWARD	REVERSE
E-B	10k Ω ~ 30k Ω	10k Ω ~ 30k Ω
C-B	50k Ω ~ 90k Ω	∞
C-E	40k Ω ~ 80k Ω	∞

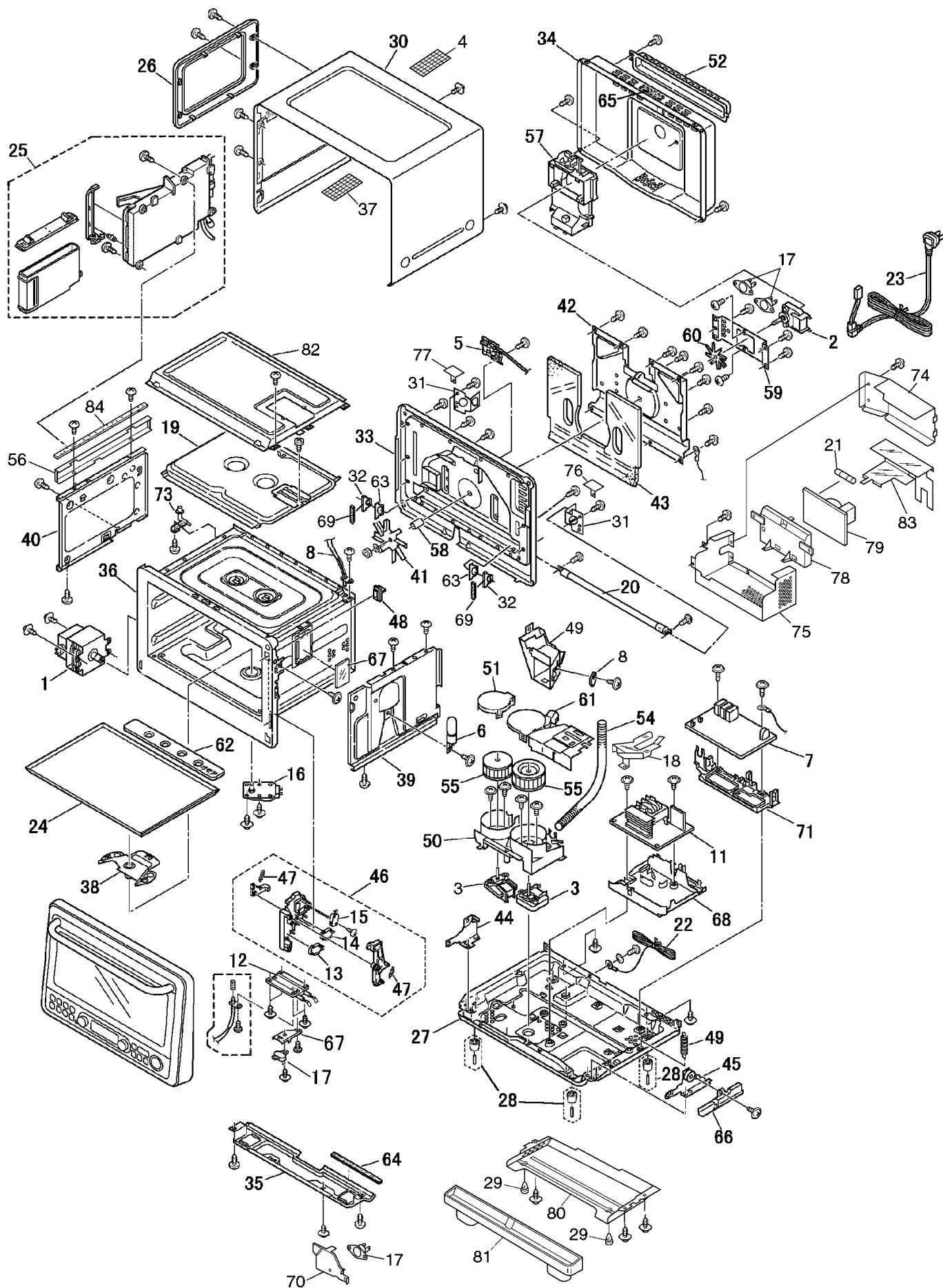
IGBT

(INSULATED GATE BIPOLAR TRANSISTOR)



	FORWARD	REVERSE
E-C	SMALL	∞
E-G	∞	∞
C-G	∞	∞

13 EXPLODED VIEW AND PARTS LIST



13.1. Parts List

Do not use description of the part.

Important safety notice:

Components identified by △ mark have special characteristics important for safety.

When replacing any of these components, use only manufactures's specified parts.

Alphabet marks in Remarks columns (l. e. HPE etc.) indicate parts applicable to only specified country models as follows.

HPE: For Hong Kong, LPK: For Philippines, MPQ: For Malaysia, TPE: For Thailand, Indonesia,

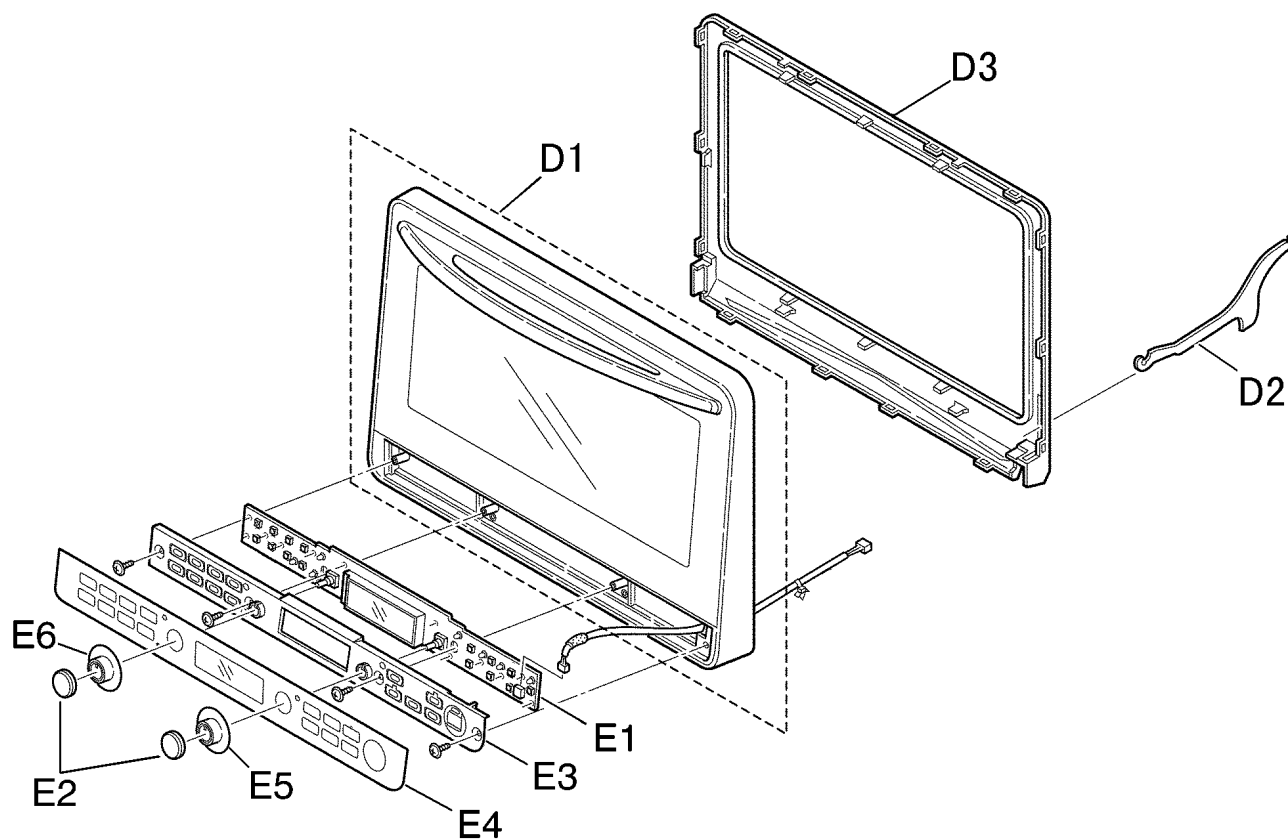
YPQ: For For Singapore, WTT: For Taiwan, XPE: China,

Parts whitout these marks can be used for all models.

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
1	2M261-M32F	Magnetron	1	△ All except WTT
1	2M261-M32G	Magnetron	1	△ WTT
2	A41796E10MP	Convection fan motor	1	All except WTT
2	A41796E10WT	Convection fan motor	1	WTT
3	A42616E10MP	Fan motor	2	All except WTT
4	ANE0922000LR	Cushion Rubber	1	
5	A601L-1F30	IR sensor	1	
6	A60306E10MP	Oven lamp	1	All except WTT
6	A6030-1A30	Oven lamp	1	WTT
7	A603L6E10MP	D.P.Circuit	1	△ MPQ/YPQ
7	A603L6E10XP	D.P.Circuit	1	△ TPE/HPE/XPE
7	A603L6E10WT	D.P.Circuit	1	△ WTT
7	A603L6E10LP	D.P.Circuit	1	△ LPK
8	A605A-1A40SP	Thermister (Oven)	1	builted in Harness W1
9	A605Y-1E20	Thermister (Magnetron)	1	builted in Harness W1
10	ANE000Z000AA	Cushion Rubber	1	
11	A606Y4V00GP	Inverter PCB	1	△ All except WTT
11	A606Y4T00AP	Inverter PCB	1	△ WTT
12	A611E6E10MP	Heater D U (Steam)	1	MPQ/YPQ
12	A611E6E10HP	Heater D U (Steam)	1	TPE/HPE/LPK/XPE
12	A611E6E10WT	Heater D U (Steam)	1	WTT
13	A6142-1900	Switch	1	△ V-16G-1C25M
14	A61424T00AP	Switch	1	△ V-16G-3C25M
15	A61425180AP	Switch	1	△ L-3C2-2
16	A61446E10MP	Motor (antenna)	1	All except WTT
16	A61446E10WT	Motor (antenna)	1	WTT
17	A61453230XN	Thermal cutout	3	
18	A42116E10MP	Air Guide H	1	for Inverter
19	A630H6E10MP	Heater U (upper)	1	MPQ/YPQ
19	A630H6E10HP	Heater U (upper)	1	TPE/HPE/LPK/XPE
19	A630H6E10WT	Heater U (upper)	1	WTT
20	A631D6E10MP	Heater C U	1	MPQ/YPQ
20	A631D6E10HP	Heater C U	1	TPE/HPE/LPK/XPE
20	A631D6E10WT	Heater C U	1	WTT
21	A62304210BP	Fuse, 10A	1	△ HPE
21	A62307160AP	Fuse, 18A	1	△ WTT
22	A91644000XN	Earth lead	1	TPE/WTT
23	A900C6E10MP	AC cord w/Plug	1	△ MPQ/YPQ
23	A900C6E10TP	AC cord w/Plug	1	△ TPE
23	A900C6E10HP	AC cord w/Plug	1	△ HPE
23	A900C6E10WT	AC cord w/Plug	1	△ WTT
23	A900C6E10XP	AC cord w/Plug	1	△ XPE
23	A900C6E10LP	AC cord w/Plug	1	△ LPK
24	A010T6E10MP	Shelf	1	All except XPE
24	A010T6E10XP	Shelf	1	XPE
25	A061D6E10MP	Water tank/Pump U	1	
26	A0660-1E10G	Frame (Tank)	1	
27	A10016E10MP	Base	1	
28	A1008-1830	Rubber foot	4	
29	A10084T00AP	Rubber foot	2	
30	A10096E10MP	Cabinet Body (U)	1	
31	A6460-1E10	Heater Mounting Plate	2	
32	A6464-1E10	Heater Support	2	
33	A101F-1E20	Back Panel	1	
34	A11836E10MP	Back panel B	1	
35	A1567-1F30	Partition panel	1	
36	A200A6E10MP	Oven	1	MPQ/YPQ
36	A200A6E10HP	Oven	1	HPE/TPE/XPE/LPK
36	A200A6E10WT	Oven	1	WTT

Ref. No.	Part No.	Part Name & Description	Pcs\Set	Remarks
37	ANE0926000AC	Cushion Rubber	1	
38	A202K-1F30	Antenna (U)	1	
39	A2236-1F30	Right Heater Panel	1	
40	A2237-1F30	Left Heater Panel	1	
41	A2239-1E20	Circulation Fan	1	
42	A2241-1E20	Back Heater Panel	1	
43	A2260-1E20	Adiabatic Material E	1	
44	A300B-1E20	Hinge (Left)	1	
45	A300U-1E20	Hinge (Right)	1	
46	A300W-1A60	Door hook (U)	1	
47	A3097-1660	Spring	2	
48	A3105-1900	Key holder	1	
49	A3230-1A40	Door Spring	1	
50	A40046E10MP	Fan case A	1	
51	A40216E10MP	Fan Case Cover	1	
52	A4024-1C20	Exhaust Guide A	1	
53	A4031-1F30	Air guide C	1	
54	A4047-1E20	Air guide E	1	
55	A4113-1A40	Fan	2	
56	A97216E10MP	Partition panel	1	
57	A4118-1E20	Air guide	1	
58	A4161-1E20	Fan spacer	1	
59	A4180-1E20	Bracket (convection fan)	1	
60	A4230-1E20	Cooling fan	1	
61	A4247-1T60	Fan case B	1	
62	A6003-1F30	Ceramic cover	1	
63	A6423-1E20	Heater Holder A	2	
64	A6180-1E10	Cushion Rubber	1	
65	A6180-1E30	Cushion Rubber	1	
66	A6392-1E20	Lead wire cover	1	
67	A6437-1E10	Lamp glass	1	
68	A6585-1T60	Inverter Bracket	1	
69	A2258-1E10	Adiabatic Material C	2	
70	A66266E10MP	Thermo SW Bracket	1	
71	A67636E10MP	PCB Bracket	1	
72	ANE0961000AV	Cushion Rubber	1	
73	A4496-1F20	Nozzle A	1	
74	A10286E10MP	Cover B	1	
75	A102586E10MP	Cover A	1	
76	A10616E10MP	Terminal cover (right)	1	
77	A10986E10MP	Terminal cover (left)	1	
78	A67976E10MP	NF PCB Bracket	1	
79	A692Y4T00YN	Noise filter PCB	1	△ All except WTT
79	A692Y6E10WT	Noise filter PCB	1	△ WTT
80	A11296E10MP	Base B	1	
81	A80236E10MP	Front Cover	1	
82	A202N6E10AP	Adiabatic Material Upper	1	
83	A42566E10WT	Air guide J	1	WTT
84	A62196E10MP	Insulation Cover	1	
	A00057J0XN	Earth Label	1	TPE/WTT
	A00064X70JP	Caution Label	1	HPE/LPK/MPQ/TPE/YPQ
	A00063310WN	Caution Label	1	WTT
	A00067680XN	Caution Label	1	XPE
	A00065540MN	Caution label	1	YPQ
	A02313330XN	CCC Label	1	XPE
	A01576E10MP	Name Label	1	MPQ
	A01576E10HP	Name Label	1	HPE
	A01576E10LP	Name Label	1	LPK
	A01576E10YP	Name Label	1	YPQ
	A01576E10TP	Name Label	1	TPE
	A01576E10XP	Name Label	1	XPE
	A05246E10WT	Name Label	1	WTT
	ANE0245X00AP	DHHS Label	1	LPK
	A02846E10YP	Number Label	1	YPQ
	A02444X70QP	Outer Panel Caution Label	1	
	A00147530XN	PL label	1	XPE
	A01706E10MP	Door label	1	
	ANE0245X00AP	DHHS Label	1	LPK
	A00324040XN	Earth Label	1	TPE

13.2. Door Assembly

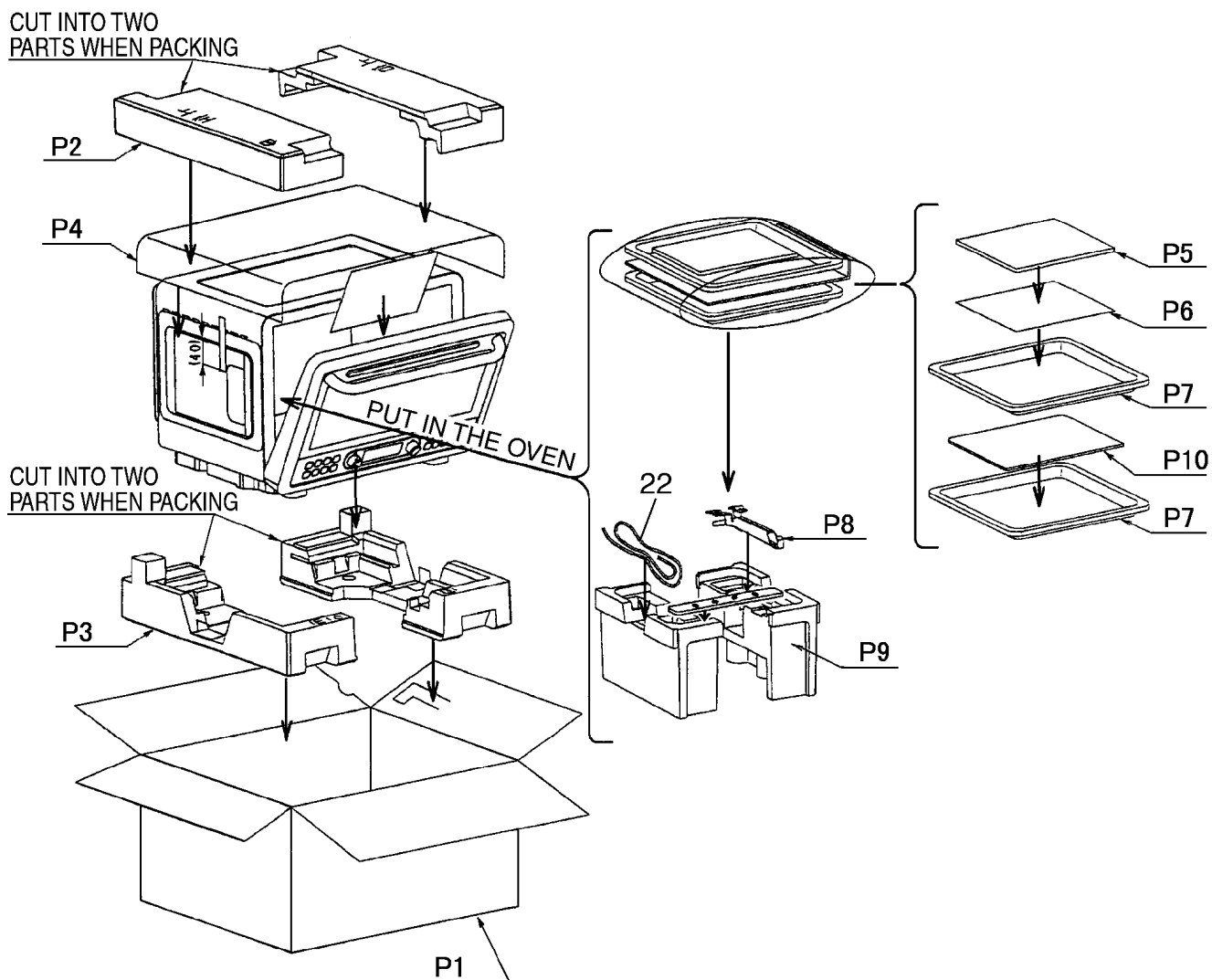


Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
D1	A302C6E10MP	Door U	1	HPE/LPK/MPQ/TPE/YPQ
D1	A302C6E10WT	Door U	1	WTT
D1	A302C6E10XP	Door U	1	XPE
D2	A3044-1E10	Door Arm (Right)	1	
D3	A390C-1F30	Door C (U)	1	

13.3. Escutcheon Base Assembly

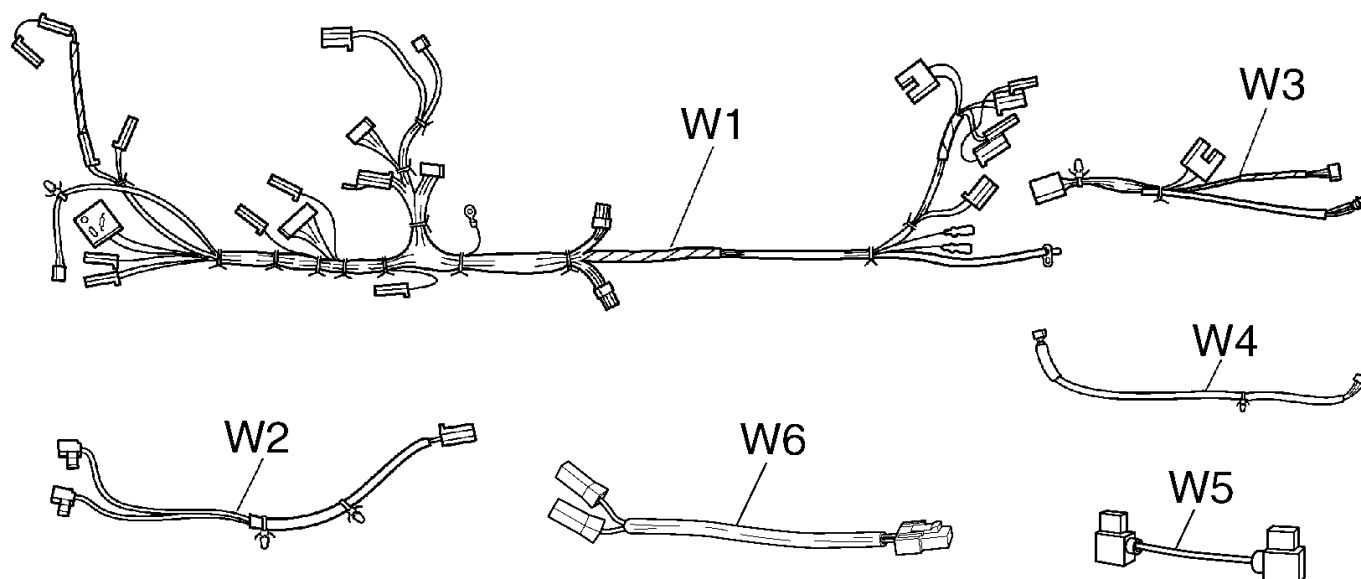
Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
E1	A605Q6E10MP	PCB F (U)	1	TPE/HPE/LPK/XPE
E1	A605Q6E10WT	PCB F (U)	1	WTT
E1	A605Q6E10XP	PCB F (U)	1	XPE
E2	A800D-1F30G	Knob	2	
E3	A8034-1F50	Escutcheon Base	1	
E4	A83376E10MP	Escutcheon sheet	1	All expect XPE
E4	A83376E10XP	Escutcheon sheet	1	XPE
E5	A83576E10MP	Trim (Right)	1	All expect XPE
E5	A83576E10XP	Trim (Right)	1	XPE
E6	A83586E10MP	Trim(left)	1	All expect XPE
E6	A83586E10XP	Trim(left)	1	XPE
	A0970-1F30	Cushion rubber	1	Paste on E3

13.4. Packing and Accessories



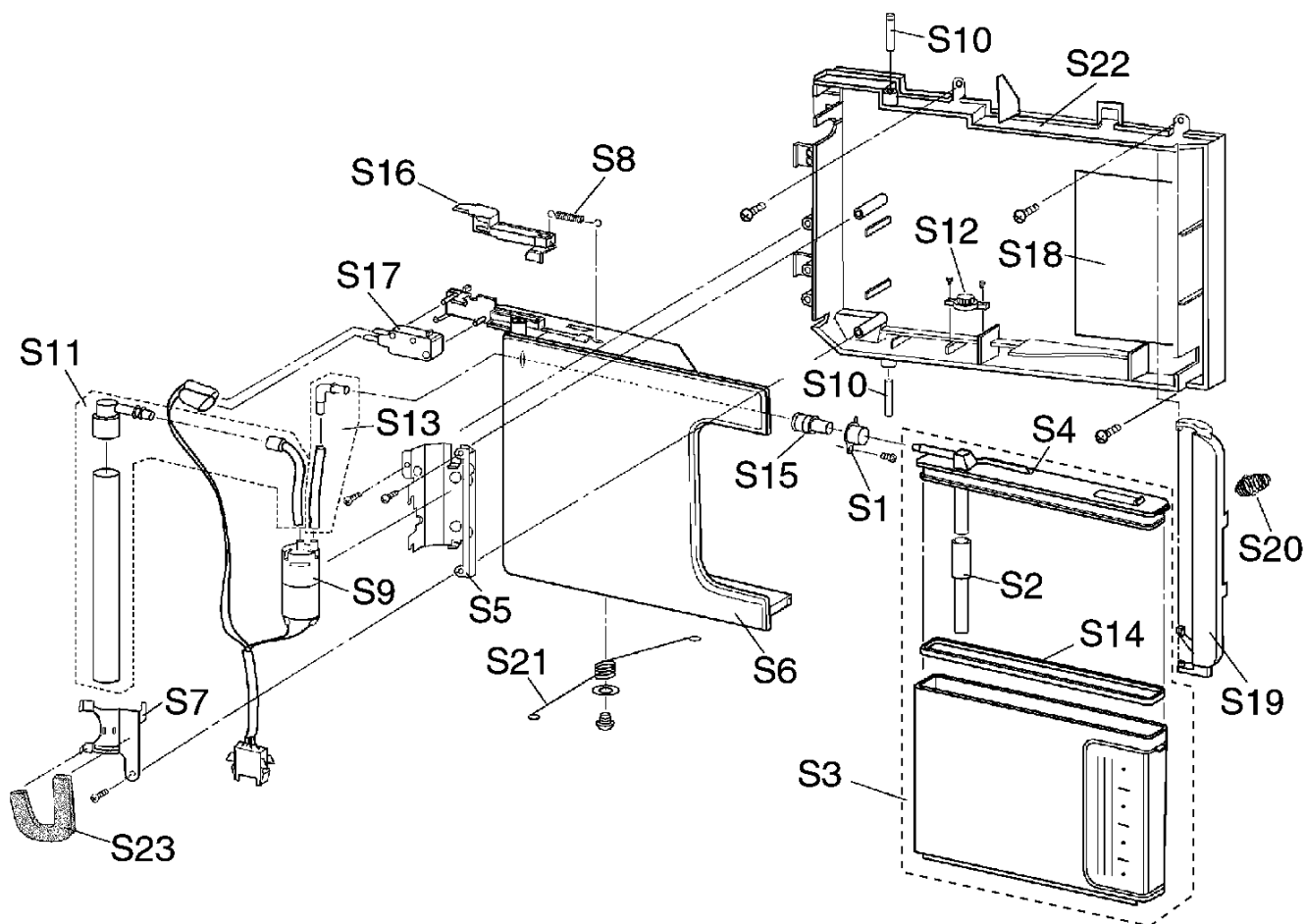
Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
P1	A01026E10MP	Packing case Paper	1	TPE/HPE/LPK/XPE
P1	A01026E10WT	Packing case Paper	1	WTT
P1	A01026E10XP	Packing case Paper	1	XPE
P2	A01046E10MP	Upper filler	1	
P3	A01056E10MP	Lower filler	1	
P4	A0106-1450	Vinyl Cover	1	
P5	A000B6E10MP	Cook book	1	All except XPE
P5	A000B6E10XP	Cook book	1	XPE
P6	A04456E10MP	Menu Label B	1	MPQ/TPE
P6	A04456E10TP	Menu Label B	1	TPE
P7	A0603-1E20	Metal tray	2	
P8	A0604-1E30	Handle	1	
P9	A0113-1E10	Tray Styrol	1	
P10	A00036E10HP	Instruction book	1	All except WTT
P10	A00036E10WT	Instruction book	1	WTT

13.5. Wiring Material



Ref. No.	Part No.	Part Name & Description	Pcs/set	Remarks
W1	A030A6E10MP	Lead Wire Harness	1	
W2	A030E6E10MP	Lead Wire	1	All except WTT
W2	A030E6E10WT	Lead Wire	1	
W3	A030H6E10MP	Lead Wire	1	WTT
W4	A03956E10MP	Lead Wire	1	
W5	A03576E10MP	Lead Wire	1	
W6	A03566E10MP	Lead Wire	1	

13.6. Water Tank Assembly

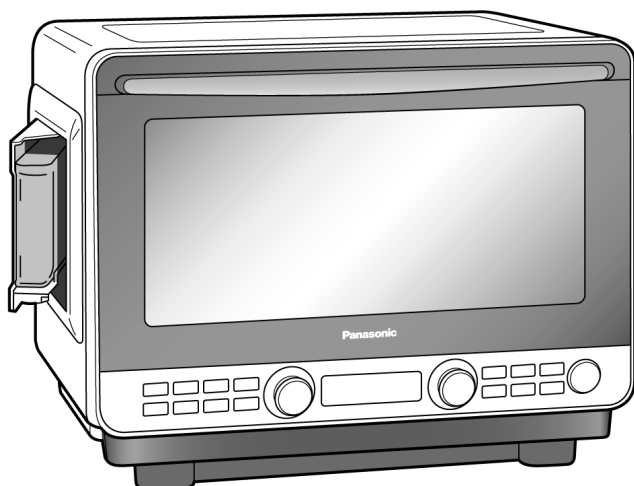


Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
S1	A0213-1E10	Pipe holder	1	
S2	A0606-1E10	Water filter	1	
S3	A060Q6E10MP	Water tank U	1	
S3	A060Q6E10XP	Water tank U	1	
S4	A06116E10MP	Tank Lid	1	
S5	A0639-1E10	Bracket	1	
S6	A0655-1E10	Door	1	
S7	A2342-1E10	Bracket	1	
S8	A3239-1E10	Spring	1	
S9	A400M-1E10	Water Pump U	1	
S10	A4274-1E10	Shaft	2	
S11	A440V6E10MP	Pipe U	1	
S12	A4419-1E10	Damper	1	
S13	A441V-1E10	Pipe U	1	
S14	A4423-1E10	Packing	1	
S15	A4424-1E10	Packing B	1	
S16	A4867-1E10	Switch lever	1	
S17	A61425180AP	Switch	1	
S18	A8058-1E10	Fluorescent seal	1	
S19	A8072-1F30	Opening Lever	1	
S20	A8136-1E10	Spring	1	
S21	A8330-1E10	Spring	1	
S22	A9836-1E10S	Case	1	
S23	ANE0962000AH	Cushion Rubber	1	

Service Manual

Microwave Oven

NN-J993



Specifications

Power Source:		240 V AC Single Phase, 50 Hz For MPQ, YPQ models 220 V AC Single Phase, 50 Hz For HPE, TPE, XPE models 220 V AC Single Phase, 60 Hz For LPK model 110 V AC Single Phase, 60 Hz For WTT model
Power Requirement:	Microwave	1,220 W 220/240 V model 1,350 W 110 V model and LPK models
	Heater	1,360/1,380 W
Output:	Microwave	1,000 W: Full Power (IEC 705-88)
	Heater	1,360/1,380 W
Microwave Frequency:		2,450 MHz
Timer:		30 min. / 2 hr. / 5 hr.
Outside Dimensions:		384 mm (H) X 500 mm (W) X 450 mm (D)
Oven Cavity Dimensions:		234 mm (H) X 394 mm (W) X 309 mm (D)
Weight:		Approx. 22.5 kg
PbF:		This product with PbF
Specifications subject to change without notice.		

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

* This product should be serviced only by trained, qualified personnel.

This service manual covers products for following markets.

When troubleshooting or replacing parts, please refer to the country identifications shown below for your applicable product specification.

YPQ For Singapore
MPQ For Malaysia
HPE For Hong Kong
WTT For Taiwan

TPE For Thailand, Indonesia
LPK For Philippines
XPE For China

INVERTER WARNING**NEW H.V.****DANGER
HIGH
VOLTAGE**

This inverter board looks like a regular PCB; However, this PCB drives the magnetron tube with extremely high voltage and high current.

IT HAS: 1. Very high voltage and high current circuit.

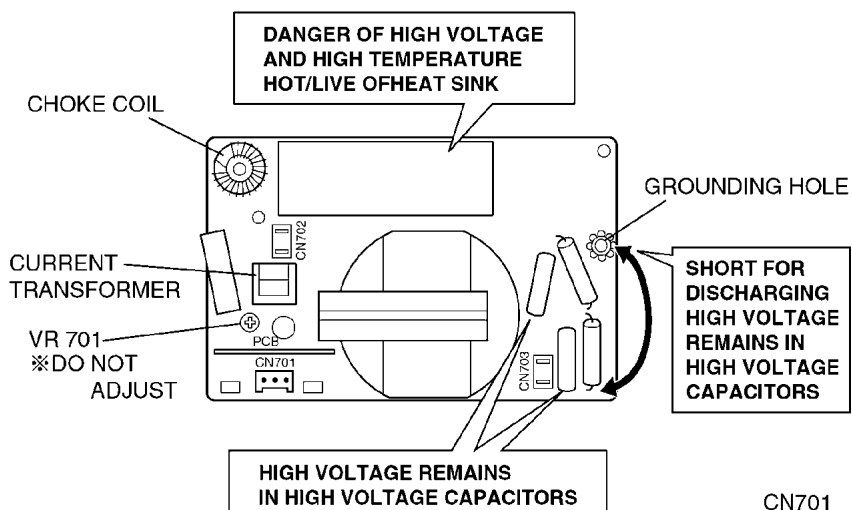
- It functions the same as the high voltage transformer and high voltage capacitor in ordinary microwave ovens.
2. Aluminium heat sink is very hot in high voltages and heat energy.
3. Very high voltage may remain in circuitry even when oven is off. High voltages may remain in the capacitors on the board.

DO NOT: *1. Do not touch circuitry because it has very hot (high voltage) circuitry. Even when replacing board, extreme care should be taken to avoid possible electric shock hazards. High voltage may remain in circuit.

*2. Do not touch aluminium heat sink because it is very hot in high voltage and also very hot in high heat energy.

*3. Do not try to adjust or tamper preset volume on the Inverter board because it is very dangerous to adjust without proper test equipment.

*4. Do not test oven while Inverter grounding strip or screws are loose. It is very dangerous to operate the H.V. Inverter Circuit (U) with loose mounting screws or if improperly grounded.

INVERTER POWER SUPPLY DIAGRAM

CN701

CAUTION**About lead free solder (PbF)**

Distinction of PbF PCB: PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

Caution: ● Pb free solder has a higher melting point than standard solder; Typically the melting point is 30 - 40°C higher.

Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 370 ± 10°C.

● Pb free solder will tend to splash when heated too high (about 600°C)

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3 OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE	8	9 COMPONENT TEST PROCEDURE	27
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6 STEAM FUNCTION(STEAM & MICRO POWER AND Reheat with STEAM.)	14	12 HOW TO CHECK THE SEMICONDUCTORS USING AN OHM METER	35
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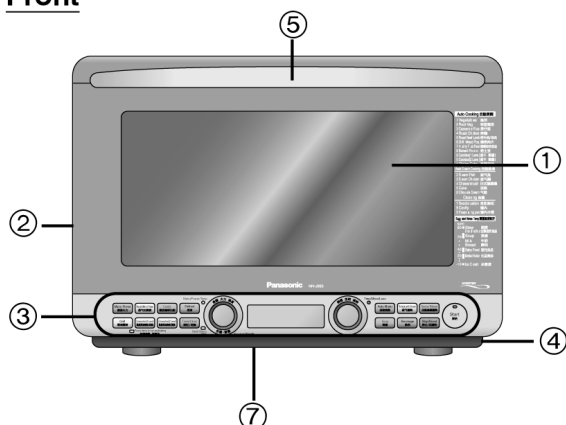
1 FEATURE CHART

FEATURE	
STEAM COOKING	✓
Steam & Micro Power	✓
Reheat with Steam	✓
Cook Navigator	✓
Maintenance Program	✓
Two Stage Cooking	✓
Sensor Reheat (IR Sensor Cooking)	✓
Auto Cooking	✓
Defrost	✓
Convection 1 Level	✓
Convection 2 Level	✓
Combination	✓
Grill	✓
Child Safety Lock	✓
Timer / Stand Time	✓
Digital Clock	✓

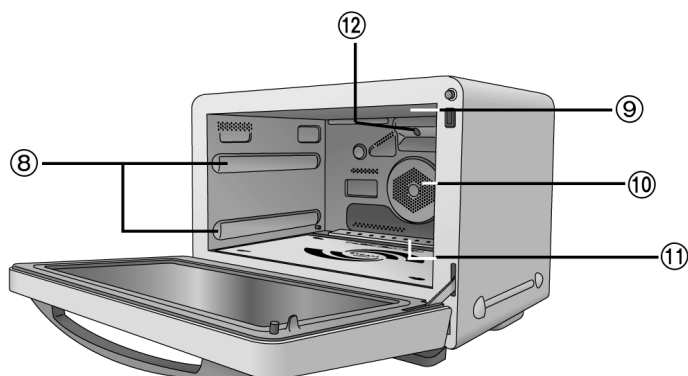
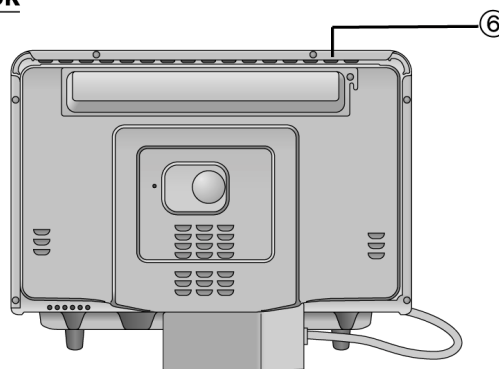
2 CONTROL PANEL

Feature Diagram

Front

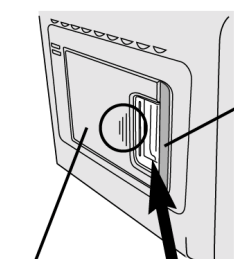


Back



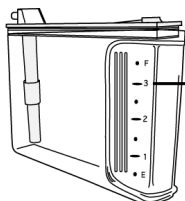
① Door

② Water Tank housing



Water Tank Door

Water Tank



Water Line

Make sure to observe the precautions described on the Water Tank. Refer to the tank for the fitting orientation of the tank.

③ Control Panel

④ Collector Pan

⑤ Door Handle

⑥ External Oven Air Vents

⑦ Air inlet (bottom)

Do not lay a sheet or place a piece of paper on the main unit or on the mounting base. Otherwise, the air inlet is blocked, leading the failure of the equipment.

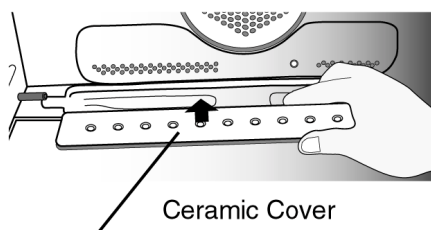
⑧ Metal Tray Rack

⑨ Upper Heater

⑩ Convection Heater

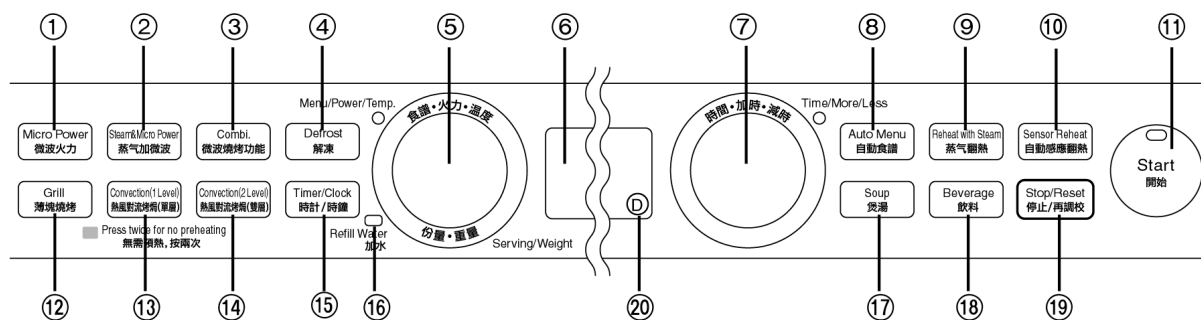
⑪ Evaporating Part

The heater built in the bottom generates steam. Always position the Ceramic Cover for using the equipment.



⑫ Infrared sensor

Control Panel



① Microwave Power Pad

② Steam & Micro Power Pad

③ Combi. Pad

④ Defrost Pad

⑤ Menu/Power/Temp./Serving/Weight Select Dial

⑥ Display Window

⑦ Time/More/Less Select Dial

⑧ Auto menu Pad

⑨ Reheat with Steam Pad

⑩ Sensor Reheat Pad

The infrared sensor checks the temperatures in the chamber and of the foods.

You can heat the foods to your favorite temperature. Do not wrap the foods or lid the container to allow the surface temperature to be detected.

⑪ Start Pad

One tap allows oven to begin functioning. If the door is opened or Stop/Reset Pad is tapped once during oven operation, Start Pad must again be pressed to restart oven.

⑫ Grill Pad

⑬ Convection 1 Level Pad

⑭ Convection 2 Level Pad

⑮ Timer/Clock Pad

⑯ Refill Water Lamp

⑰ Soup Pad

⑱ Beverage Pad

⑲ Stop/Reset Pad

Press when you quit cooking in the midway or you have presses a wrong pad. When you check how the cooking is progressed, open the door instead of pressing the Stop/Reset Pad. When you resume the cooking, press the Start Pad.

Before cooking:

One tap clears your instructions.

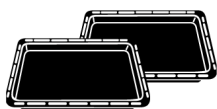
During cooking:

One tap temporarily stops the cooking process. Another tap cancels all your instructions and time of day appears in the Display Window.

⑳ Demo Mode Sign

Demo Mode ("D") is designed for retail store display. Cooking and other functions will not operate during Demo Mode. To cancel the Demo Mode, keep pressing the Microwave Power Pad for 2 seconds.

Oven Accessories



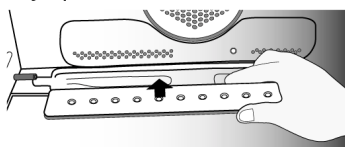
Metal Tray



Ceramic cover

A Metal Tray is used for Grill or Convection cooking. Do not use a Metal Tray for Combination or Soup and Micro Power Cooking.

Place a Ceramic cover on the section where steam is generated. Always position the Ceramic cover.

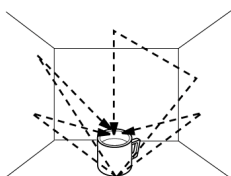


NOTE:

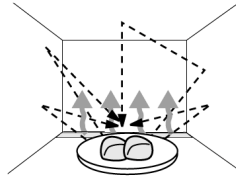
Do not touch the Ceramic cover or the Evaporating Pan, because they are very hot immediately after the cooking.

Cooking Modes; Heating Source

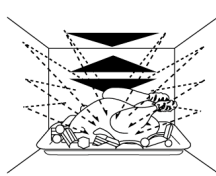
Microwave, Soup



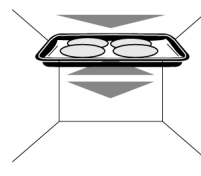
Steam & Micro Power



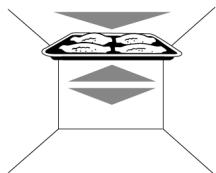
Combination



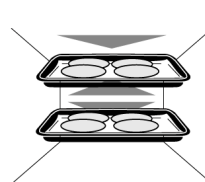
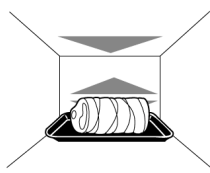
Grill



**Convection bake
1 Level**

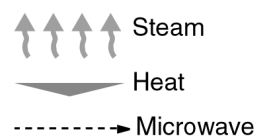
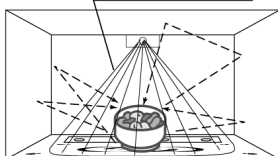


**Convection bake
2 Level**



Sensor Reheat

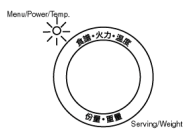
Infrared sensor



Cook Navigator

This feature allows you to guide you thorough the cooking process. Once a pad has been selected, the oven will prompt you the NEXT step until cooking starts.

e.g.



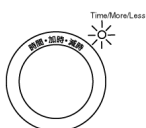
- Set the cooking temperature.
e.g. After pressing the Convection Pad.
or

- Select Menu.
e.g. After pressing Auto Menu Pad.
or

- Set the weight.
e.g. After pressing the Defrost Pad.

- Set the cooking time.
e.g. After selecting the Micro Power Level.

- Press Start Pad.
e.g. After pressing the Micro Power level and time.



3 OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

1. To Set Clock

OPERATION	SCROLL DISPLAY
1. Plug the power supply cord into wall outlet.	:
2. Press Timer/Clock pad-twice.	☀ TIME/MORE/LESS
3. Enter time of day (TOD) by Turning Time/More/Less (Right). EX: 11: 25	☀ TIME/MORE/LESS 11:25
4. Press Timer Clock pad. TOD has now been registered into the digital programmer circuit and will count up by minutes.	11:25

2. Time Cooking for Two Stage

OPERATION	DISPLAY
1. Place a water load in the oven.	
2. Press Micro Power button once to set High power. (1st stage)	☀ MENU/POWER/TEMP Micro wave 1000 W
3. Set for 10 seconds by Turning Time/More/Less knob (Right).	10 Sec ☀ START
4. Press Micro Power button and Turn Menu/Power/Temp to set 300W power. (2nd stage)	Micro wave 300 W ☀ MENU/POWER/TEMP
5. Set for 1 minute by Turning Time/More/Less knob.	1 Min 00 Sec ☀ START
6. Press Start button.	Micro wave 1000 W 10 Sec
7. When 1st stage cooking time has elapsed, oven automatically switches to 2nd stage cooking.	Micro wave 300 W 1 Min 00 Sec
8. When 2nd stage cooking time has elapsed, oven beeps 5 times and shuts off.	5 BEEPS ☀ TIME/MORE/LESS

9. You may set additional cooking time by simply turning Time/More/Less knob for desired time and push Start Button.

10. When cooking time elapsed, Oven beeps 5 times and shut off.

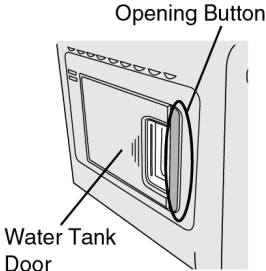
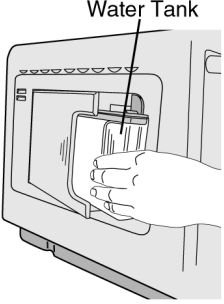
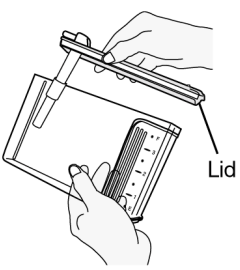
3. Defrost

OPERATION	DISPLAY
1. Press Defrost pad.	☀ MENU/POWER/TEMP DEFROST
2. Set the weight for 3 kg by Turning Menu/Power/Temp knob.	DEFROST 3.0 kg ☀ START
3. Press Start button.	☀ DEFROST 54 Min

4. Convection Cooking with Preheat

OPERATION	DISPLAY
1. Press Convection 1 level button.	150°C
1-2. Set 110°C by Turning Menu/Power/Temp knob.	☀ MENU/POWER/TEMP ↓ ☀ START
2. Press Start button.	Set-up 110°C Preheat ☀ Conv
3. When preheating is completed, oven beeps 5 times.	Set-up 110°C Preheat ☀ Conv
4. After completion of preheating, be sure to open the door.	110°C 0 Sec ☀ TIME/MORE/LESS
5. Close the door and set convection cooking time for 2 minutes.	Set-up 110°C 2 Min 00 Sec ☀ START ☀ Conv
6. Press Start button.	Set-up 110°C 2 Min 00 Sec ☀ Conv

5. Steam & Micro Power

OPERATION	DISPLAY
1. Press the center of opening button to open the water tank door(left side of oven).	 Opening Button Water Tank Door 15-001M
2. Remove water tank	 Water Tank 15-002M
3. Open the lid of the water tank and pour pure·distilled water to the "F" (full)mark of the tank.	Do not use mineral water of tap water. Unless mineral will concentrate in the oven and cause damage oven.  Lid 15-003M
4. Close (cap) the lid of tank	
5. Insert the water tank into the main unit while observing the allow stamped on the tank and close the water tank door. Place a cup of water.	
6. Press Steam & micro power button.	Micro Wave Steam REFILL WATER When tank is empty. TIME/MORE/LESS

7. Set cooking time using the Time/More /Less knob(ex.5 minutes).	Micro Wave Steam 5 Min 00 Sec START
8. Press start button.	Micro Wave Steam Preheat 1 Min 50 Sec
9. Water will be pumped up to steam generator tray once in a while. (Preheat Time is 2 minutes.)	(You may hear the water sucking sounds once in a while.)
10. When preheat is completed timer turnd into steam cooking mode and water keep supplying. Microwave cooking started.	Micro Wave Steam 5 Min 00 Sec Count down. When water tank become empty. REFILL WATER Oven will stop by itself.

6. Child safety lock

OPERATION	DISPLAY
To set : Press START button 3 times.	
To cancel : Press STOP/RESET button 3 times.	

7. Sensor reheat

※The cooking food temperature is detected by infrared sensor.

So you do not have to set the cooking temperature.

OPERATION	DISPLAY
1. Place a cup of water at the center of oven.	
2. Press Sensor reheat button. Previous heated temperature will appears such as 70℃.	Set-up 70℃ REFILL WATER
3. Set your favorite temperature with Menu/Power/Temp select knob.	Set-up 65℃
4. Press Start button.	Set-up 65℃
5. In about 50 seconds now temperature will be appears in display window.	Set-up 65℃ Now 35℃ ↓ 40℃ ↓ 50℃
6. When water temperature reaches programmed temperature of 65℃. Oven beeps and stop automatically.	
7. Oven will beeps as remainder if door is not open.	

8. Reheat with steam

※Heat foods while applying moisture Cooking range of 100g to 500g.

OPERATION	DISPLAY
1. Follow the steps 1-5 of steam & micro power. Note:when removing water tank,you may hear pumping noise.	PLACE A CUP OF WATER
2. Press Reheat with steam button. ※You may select more or less (65~ 80℃) .	● TIME/MORE/LESS Steam Less More -START-
3. Press Start button. When water heated up select temperature timer count down and stop automatically.	

9. Auto menu

※There are 16 auto cooking menu and additional 3 maintenance program is available.

OPERATION	DISPLAY
1. Push Auto menu button.	Auto 1 100g Less More ↑ AUTO MENU WEIGHT MENU/POWER/TEMP ● TIME/MORE/LESS ● START
2. Set desired auto-menu by turning Menu/Power/Temp key Ex : Roast chicken 600g.	Auto 4 600g Less More ↑ You may adjust More/less ● MENU/POWER/TEMP ● TIME/MORE/LESS ● START
3. Press Start button.	Auto 4 600g ↓ 32 Min Less More
	Timer countdown and stop cooking automatically.